

District Court, N.D. Illinois, Eastern Division.  
ACTIVATED SLUDGE, Inc., et al.  
v.  
SANITARY DIST. OF CHICAGO.  
**No. 4280.**

Jan. 26, 1946.

64 F.Supp. 25

[Aff'd per curiam: 157 F.2d 517 (7<sup>th</sup> Cir. 1946); cert. denied: 330 US 856, 1947]

Action by Activated Sludge, Inc., and others against the Sanitary District of Chicago, to recover compensation for infringement of patents.

Judgment in accordance with opinion.

Owners of patents relating to activated sludge process were, under evidence, entitled to recover \$950,000 as compensatory damages from Sanitary District of Chicago for infringement of patents over some 20 years. 35 U.S.C.A. §§ 283-286, 290.

**\*26** Charles L. Byron and Gordon F. Hook, both of Chicago, Ill., for plaintiff.  
Ernst Buehler, Edmund D. Adcock, Ralph M. Snyder, and Eli E. Fink, all of Chicago, Ill., for defendant.

LINDLEY, District Judge.

We are concerned here with the amount of compensation defendant should pay plaintiffs for infringement of patents held valid and infringed by decree dated February 8, 1935. The patents involved, their nature, their character, their advantages and limitations and the annals of the long extended litigation between plaintiffs and defendant and the city of Milwaukee are largely reflected by the findings of fact and opinions in Guthard v. Sanitary Dist. of Chicago, D.C.,

8 F.Supp. 329, affirmed by the Court of Appeals, 7 Cir., 90 F.2d 727, and affirmance of a like decree in the Milwaukee case, Fehr v. Activated Sludge, Inc., 7 Cir., 84 F.2d 948. After affirmance of the decree of this court, defendant attempted to reopen the case. The order denying its petition, entered July 5, 1940, D.C.,\*27 33 F.Supp. 692, was affirmed in 7 Cir., 118 F.2d 899. In view of the extended exposition appearing in the published reports, I see no necessity of elaborating upon the innumerable details involved except to the extent to do so may be helpful in determination of the issue now presented.

Various claims of the patents were infringed by defendant's Calumet, Des Plaines and North Side plants. The contract for the construction of the Des Plaines plant was let May 1, 1919 and the works went into operation August 2, 1922 and continued in use until October 15, 1931. The Calumet plant was placed in operation June 5, 1923, after completion of a contract let September 6, 1920. It continued in operation until October 31, 1931 when one infringing unit was closed. Another remained in operation until September 3, 1933. The contract for construction of the North Side Works was let August 9, 1923. The plant began to operate October 3, 1928 and has remained in constant use. The contract for the Calumet extension plant was let May 7, 1931. This began operation December 3, 1935 and is still being operated, employing, allegedly, activated sludge methods.

Little dispute exists as to the elements to be considered in this proceeding. They include the character of the inventions, their utility, their history, their practicability and advantages, including savings resulting from their adoption, the usefulness and commercial value reflected by their advantages over other devices or processes and the extent of their use.

The damages allowable under Section 70, Title 35 U.S.C.A., include those which may be determined to more or less exactitude in dollars and cents and those which are more elusive. The law is not impotent in attempting precise valuation, even though no market value exists and no loss or impairment of sales can be proved. The court, in possession of all the facts and circumstances, makes its determination from them. Malleable Iron Range Co. v. Lee, 7 Cir., 263 F. 896, United States Frumentum Co. v. Lauhoff, 6 Cir., 216 F. 610.

Here neither party is engaged in commercial production. The product of the patents is not generally bought and sold in the open market; rather their value lies in their teachings of advanced methods in the treatment and purification of sewage by cities and other municipal bodies. As I said at the time I entered the decree of infringement: 'All these patents and the art with which we are

concerned have to do with inventions intended so to hasten nature's process as to bring about purification of sewage in the course of so short a time as to make the suggested process of great practical value to mankind, struggling with sewage disposal in modern congested centers.' Under these circumstances there is no evidence of profits gained by defendant or loss to plaintiffs in manufacture and sale.

The solution must come from other sources. Proof of an established royalty is evidence of the value of what has been taken. *Dowagiac Mfg. Co. v. Minnesota Moline Plow*, 235 U.S. 641, 35 S.Ct. 221, 59 L.Ed. 398. Otherwise it is incumbent upon the court to determine a reasonable royalty compensating plaintiffs for the value of what has been wrongfully taken by defendant. As the Supreme Court has said, such proof is sometimes difficult to produce, but it is quite as admissible as that of an established royalty, *Dowagiac Mfg. Co. v. Minnesota Moline Plow*, *supra*, and recovery is allowed as general damages but not as profits. *Overman Cushion Tire Co. v. Goodyear Tire Co.*, 2 Cir., 66 F.2d 361; *Collins v. Hupp Motor Corp.*, 6 Cir., 22 F.2d 27; *Standard Brands v. Federal Yeast Corp.*, D.C.D. Md., 38 F.2d 314; *A.T. & T. v. Radio Audion Co.*, D.C.D. Del., 5 F.2d 535; *Alliance Securities Co. v. DeVilbliss Mfg. Co.*, 6 Cir., 76 F.2d 503.

The evidence here, I think, is conclusive that there has not been at any time an established royalty which could be applied as measure of damages in this case. Accordingly, it is necessary to determine from the evidence what would be fair general damages including a reasonable royalty, taking into consideration the elements I have mentioned and others, by which, under the decisions of this circuit, I am bound, including the success of the patents and their use. *B. F. Goodrich Co. v. Consolidated Rubber Tire Co.*, 7 Cir., 251 F. 617; *Malleable Iron Range Co. v. Lee*, 7 Cir., 263 F. 896. See also *United States Frumentum Co. v. Lauhoff*, 6 Cir., 216 F. 610; *Root v. L.S. & M.S.R. Co.*, 105 U.S. 189, 26 L.Ed. 975; *Standard Brands, Inc. v. Federal Yeast Corp.*, D.C.D. Md., 38 F.2d 314; *General Motors v. Blackmore et al.*, 6 Cir., 53 F.2d 725; *Dunkley Co. v. Central California Canneries*, 9 Cir., 7 F.2d 972.

In assessing the utility and practicability of the patented activated sludge process, it may be helpful to review briefly the historical facts of sewage disposal in the city \*28 of Chicago. Thus can we obtain a sketchy picture, at least, of the problem as it developed over the years until it became extraordinarily involved and difficult of solution. Before the Sanitary District was created, the city had grown rapidly from the days of Fort Dearborn to a thriving metropolis. The sluggish Chicago river and its two branches drained an area east of the

subcontinental divide, discharging into Lake Michigan, the highest elevation of the river being only a few feet above that of the lake. On the other hand, the Des Plaines river, rising in Wisconsin and flowing southwesterly into the Illinois river, drained to the west of the divide. In this flat country, two rivers, the Des Plaines and the Chicago, very near each other, drained in opposite directions, the waters of one reaching the St. Lawrence and the Atlantic through the Great Lakes and those of the other, the Gulf of Mexico through the Mississippi. Obviously, the flatness of the land in the Chicago area tended to bring about inertia and sluggishness of water and poor drainage. Floods from the Des Plaines added to the sluggishness and pollution of the Chicago. Thus, slow moving sewage, carried by the Chicago into Lake Michigan for dilution, created noxious conditions at the lake entrance to the great city and even threatened its source of supply of drinking water from the lake. Two important problems thus became intimately involved, sewage and water supply. In the words of the Supreme Court in *Wisconsin v. Illinois and Sanitary District*, 278 U.S. 367, 49 S.Ct. 163, 166, 73 L.Ed. 426: 'Before 1865 the Chicago river, being a sluggish stream in its lower reaches, had become so offensive, because of receiving the sewage of the rapidly growing city, that for its immediate relief the municipal authorities and the canal commissioners agreed to pump water from the river in excess of the needs of navigation. By 1872 the summit level of the canal had been lowered, and it was hoped that this would result in a permanent flow of lake water through the south branch of the Chicago river, sufficient to keep it in good condition, but the plan failed, and the canal again became grossly polluted.'

In 1881 the city was still pumping water from the lake in an attempt to increase purification of the sewage in the river and in the Illinois and Michigan canal, but the existing nuisances along the latter persisted. *Wisconsin v. Illinois*, supra. Finally, in 1889, defendant District was organized under a state statute, with the express purpose of attempting to solve the problem of handling and purifying sewage from Chicago and its surrounding community. The first step was construction of the main drainage canal, completed in January, 1900, which effected a reversal of flow in the Chicago river and placed Chicago in the Mississippi Valley water-shed. This afforded temporary relief. As early as 1908, we find the District, when the Secretary of War refused to permit it to proceed with the work of opening the Calumet Sag Channel from Calumet Lake to the main drainage canal, thus bringing about greater diversion of lake water, continuing its preparations for the construction. *Wisconsin v. Illinois*, supra. Actually, the District increased its diversion of lake water from 4,167 cubic feet per second permitted by the War Department to 8,500 cubic feet per second. A suit to enjoin this diversion resulted eventually in a decree in favor of the

Government, nine years later. More detailed facts appear of record in *Sanitary District of Chicago v. United States*, 266 U.S. 405, 45 S.Ct. 176, 69 L.Ed. 352, and *Wisconsin v. Illinois and Sanitary District of Chicago*, supra. In the latter, the court said: 'Had an injunction then issued and been enforced, the Port of Chicago almost immediately would have become practically unusable, because of the deposit of sewage without a sufficient flow of water through the canal to dilute the sewage and carry it away.'

It must have been perfectly obvious to the District, and its own engineers' recommendations so indicate, that, confronted with an inadequate supply of water from Lake Michigan to the Illinois river, creation of some artificial means for reduction of pollution was mandatory; otherwise dire consequences would arise. Why decisive action was delayed over the years it is difficult to understand. Perhaps we should attribute the delay to the inertia with which municipal corporations are frequently afflicted. Eventually, however, the recommendations of its engineers wakened the authorities of the District to the acuteness of the trouble confronting them. One of the trustees reported in 1919 that the stockyards' wastes were of such character that no known methods of reducing human sewage or other wastes could be applied; that, beginning in 1914, the District had considered Imhoff tanks and sprinkling filters but, in its experiments, had found serious objection\*29 to such a plan; that, in 1915, the activated sludge method was receiving consideration by sanitary experts and that it was thought that its processes might be applied to the stockyards problem, eliminating odors and other nuisances which were expected to arise from operation of the Imhoff tanks and sprinkling filters. The same trustee reported further that in 1915 the activated sludge process was in an experimental state; that an experimental plant had been constructed at Milwaukee; that one advantage of the method was the probability that from the solids and sludge a fertilizer could be manufactured which would have commercial value; that, since 1915, the District itself had constructed an experimental plant in the stockyards district which had since been in operation; that the packing companies had carried on similar experiments; that Milwaukee had constructed an extended plant employing the method; that the trustee and the engineers of the District had visited all such plants in operation, as well as experimental plants located in various parts of the country, and that within the years 1918 and 1919 all parties concerned, including the District and the packing houses, had reached the conclusion that 'the activated sludge method can be applied to the elimination of the stockyards wastes and the abatement of the nuisance existing there.'

In the same report it was said that the condition of the drainage canal and the

rivers below had gradually deteriorated; that pollution had markedly extended further down stream each year so that at that time the Illinois river was practically devoid of fish life as far as Lake Peoria; that pollution was becoming worse in the Des Plaines and Illinois rivers and that something had to be done to remedy conditions and abolish crying nuisances along the outlet streams. The records of the District disclose that the chief engineer had been present at all of the negotiations with the Government and that no settlement could be reached unless the District would undertake to construct works calculated to remove the trade wastes; that, when it is remembered that the problem is intimately connected with the settlement of the lake level controversy and when one appreciates the 'howling nuisance that now exists in Bubbly Creek, a creek of international reputation,' it would seem to be folly not to enter into construction of works correcting the evils; that the Board of Trustees had been advised that the activated sludge process 'was the correct one' and that this was 'now universally accepted'; that the dilution system had cost the public \$130,000,000 which otherwise would be wasted and that any other means of handling the problem would cost from \$150,000,000 to \$200,000,000 and be but experimental at best. The Supreme Court said in *Wisconsin v. Illinois and Sanitary District*, supra, 'The Sanitary District authorities, relying on the argument with reference to the health of its people, have much too long delayed the needed substitution of suitable sewage plants as a means of avoiding the diversion in the future. Therefore they cannot now complain if an immediately heavy burden is placed upon the district because of their attitude and course.'

The diversion method having failed, the engineers having reported the advantages of the activated sludge process over the Imhoff trickling filter process, we find the authorities of the District quite naturally and wisely adopting as cure for the ill, the use of that process. The District reported to the Government, *Wisconsin v. Illinois*, 289 U.S. 395, 407, 53 S.Ct. 671, 77 L.Ed. 1283, 1465, new methods which it intended to use in the Southwest Side Treatment Works. Presumably this was the activated sludge process, for the District, as we have seen, had learned and announced that that process was the 'correct one.' It assured the Government that these new methods 'were more economical both in construction and operation.'

When the District completed the North Side plant employing the patented process and made its public report of the formal opening of the project, it announced that the plant constituted 'the largest and most modern project of its kind in existence' and described it thus: 'The North Side Plant is a new type of fortress, guarding not one but many cities. Its function is to assure the well-being

of a tremendously large population by repelling conditions destructive to health. It is a creation of science and engineering technique devoted to a single humanitarian purpose. And in the efficient accomplishment of the design, it is acknowledged to have no equal.' It reported that engineers from all over the world had examined the plant and approved it in terms, representative of which are these words: 'It is the most marvelous undertaking of its kind in the world.' The District referred to the results thus: \*30 'Looking at the North Side Plant \* \* \* it is difficult to believe that this is a place where sewage is purified. \* \* \* There is absolutely no odor, nor are there any offensive qualities. The huge purification tanks, where the sewage flows openly but odorlessly \* \* \* below ground level are not directly visible from the thoroughfare which parallels the property \* \* \* . ' And it boasted of the effluent: 'Almost as clear as drinking water, and quite as harmless, the final effluent leaves the plant through this outlet, entering an artificial channel which discharges into the Chicago river'; and added 'It demonstrates the Sanitary District's sincerity in complying with the federal government's demand for the construction of artificial sewage treatment facilities by December, 1929, equivalent to the complete (100 per cent) treatment of a population of 1,200,000. It is an important factor in the stream purification movement, since its purifying effect will be felt in the Illinois river as far as one hundred miles below Lockport, Illinois.'

The Court of Appeals said in *Milwaukee v. Activated Sludge*, 7 Cir., 69 F.2d 577, at page 581: 'How to dispose of abnormal amounts of sewage, caused by the growth of population and industry was a question that confronted the scientist and inventor from very early years, and it was never answered successfully prior to the disclosures out of which this controversy arises. \* \* \* the method \* \* \* disclosed for the first time by the Jones patents, \* \* \* it is admitted by both parties was invention and of revolutionary benefit to mankind. ' After pointing out that the experiments with Imhoff tanks and sprinkling filters had shown such method to be inferior to that of activated sludge, Judge Geiger in the District Court concluded that in this respect 'the activated sludge system had vindicated the choice of the city and the commission.'

It is apparent that not only has it been adjudicated by the courts but that it has been declared and redeclared by the authorities of the District that the activated sludge process was the best, the most efficient, the most useful and in fact the only process by which the District could solve satisfactorily its tremendous problem. Surely it is too late to controvert such evidence of the practicability of the processes.

As early as 1917 Engineer Hatton, after consideration of ten other projects, recommended the activated sludge process as the most desirable, 'the best adapted' type of artificial sewage treatment for the handling of the extremely critical sewage situation in Milwaukee. Another eminent sanitary engineer, Eddy, agreed; Pearse, sanitary engineer for the District, whom this court deems as competent as any, was well acquainted with the experiments of both Hatton and Eddy and their recommendations and with those of Fowler and his English associates, Richardson, representing the stockyard interests, recommended installation of the activated sludge process and the experiments at Packingtown formed a sound basis for design and installation of the Des Plaines river and Calumet activated sludge plants, culminating in the construction of the boasted North Side Sewage Treatment Works. This situation I discussed in my opinion, Guthard v. Sanitary District, D.C.N.D. Ill. E.D., 8 F.Supp. 329, and the Court of Appeals, in Sanitary District v. Activated Sludge, 7 Cir., 90 F.2d 727. It might well be summed up as did the chief engineer in 1935: 'Up to the present time no method has been found by the Sanitary District which is as well suited to the requirements of the sewage treatment problem as the activated sludge process.'

The advantages of the process are beyond question. Pearse testified concerning them in the present record. The evidence is strengthened by the fact that the District has adopted the process in practically all of its plants. Such a plant can be built on a smaller area. It produces a higher grade effluent; it removes B.O.D. and suspended matter. It does away with odors and putrefication. It effectively prevents development of the fly pest resulting when trickling filters are used. It removes detrimental aspects along streams down which sludge passes; it reduces the cost of land taken for public purposes; it eliminates effectively the abhorrent septic and putrid conditions formerly existing along outlet waterways.

Pearse, in his testimony in this hearing, has claimed certain advantages for Imhoff plants and certain disadvantages for activated sludge methods. He is an able, honest and efficient engineer, I think. He would not consciously warp the truth in the slightest degree. But he is a partisan,- this District and its problems are his babies. He and he alone is charged every day and moment of his life, with the care, maintenance and development of its sanitary \*31 works. The most pragmatic of parents can not always be wholly unbiased when his offspring is on trial. But even Pearse admits advantages of the process, and his engineering advice to the District over the years has been such that the authorities of the District have come to recognize publicly, not only by their words but by their deeds, that the most effective method for handling Chicago sewage, avoiding controversy with the federal government, removing nuisances to property owners

and producing hygienic aerobic sludge and effluent lies in the activated sludge process. Indeed as early as 1922 the engineers reported that 'Activated Sludge works are preferable to Imhoff tank trickling filterworks,' pointed out the specific advantages and, in conclusion, said we 'therefore eliminate from further consideration the Imhoff tank trickling filter project for the North Side Treatment Works.' Pearse says, after consideration of various methods, 'We went ahead and built that plant with the expectation that we would have a high-grade effluent coming down the North Side channel, and that would be a benefit to us.'

An important element in the consideration of the results of sewage treatment is the residual biochemical oxygen demand in the effluent. The sanitary engineer is essentially interested in reducing this 'B.O.D.' and the suspended solids. Reduction in bacterial content is a factor of primary consideration and obviously proved of great importance to the citizens of Chicago, both when the Chicago River flowed east and when it flowed west. The record is full of proof of the advantage of the activated sludge process over any other in this respect the B.O.D. of the comparatively poor effluent from the Imhoff process being 3 1/4 times that of the activated sludge process. This factor affects, to an almost vital degree, the whole question of purification of sewage. Realization of its advantages undoubtedly had convincing influence upon the authorities of the District, in concluding that the activated sludge was the best method to be used, in their decision to carry that conclusion into effect in the construction of such plants and in their utilization over a long period of years. So, as Pearse said, 'we charted the course, we followed it and to date we have not regretted it.'

I have commented perhaps unnecessarily at length on some of the facts dealing with the utility, the practicability, the advantages of Jones' patented inventions belonging to plaintiffs which defendant has on so large a scale infringed. Defendant's use of the devices and processes has so long been known that it is not now in position to deny the implied approval. The admissions thus made carry more forceful recognition of the value of the patents infringed than belated attempted denial of their value. *Enterprise Mfg Co. v. Shakespeare Co.*, 6 Cir., 141 F.2d 916. I conclude from what I have enumerated and other facts and circumstances in this record that there can be no question as to the sufficiency of the evidence to sustain findings of unusual utility, of efficient practicability, of undisputed advantages. All of such facts must enter into the determination by this court of what is just compensation for invasion of plaintiffs' rights.

Plaintiffs have made various computations of figures in the record reflecting savings in construction and operation of the infringing works, the accuracy of

result of which defendant disputes. It is undisputed that the cost of the North Side plant, less land value, was \$23,800,426 as against an estimate by consulting engineers of some \$10,000,000 less. Plaintiffs present persuasive argument from the record facts that the cost was exorbitant, but I have the feeling, in view of what I am deciding, that it is not now necessary to adjudicate that controverted issue.

Plaintiffs contend that, under proper analysis of record data, defendant realized on this plant a construction saving of over \$2,800,000 and saving in operational costs of over \$100,000 per year of operation. On another basis it calculates the total savings in construction and operation at \$12,900,000. It suggests again from another view point, that the total savings of all the infringing plants amounted to \$8,700,000 and, if realization of profits from sales of sludge as fertilizer were achieved by defendant, that this figure would be \$9,379,000 for all infringing plants. It calls attention to still other figures and presents as the average of its various computations, total savings of \$11,053,790. It is extremely difficult for one to determine definitely what the exact monetary savings to defendant, arising from its adoption and use of infringing apparatus and processes, was, but one must inevitably find that the monetary savings were tremendous. The exact amount is unimportant, for savings as such, \*32 are not the monetary yardstick of defendants' liability. The fact that there were savings, is, however, a factor to be considered, for, coupled with defendant's achievement in purification of sewage, its accomplishment, whether costly or cheap, resulting from its utilization of the patented devices and processes, is illuminating, helping to give one a clear picture of just what has transpired. Then, too, the fact that there were savings in costs is relevant upon the issue of the advantages arising from use of the inventions. That the fact that savings did result is a factor to be considered in determining a reasonable royalty is apparent from such authorities as *Standard Brands v. Federal Yeast Co.*, D.C. Md., 38 F.2d 314; *Horvath v. McCord Rad. & Mfg. Co.*, 6 Cir., 100 F.2d 326.

I have given no consideration to a possible saving resulting from sale of sludge as fertilizer, but it might be well to observe the facts in that respect. Why defendant did not avail itself of the savings in operating resulting from sale of sludge as a commercial commodity, fertilizer, is not satisfactorily explained. Milwaukee has consistently profited from this by-product, realizing annual revenues of \$330,000 after only a year of operation. I conclude that no good reason is supplied for defendant's failure to do likewise. It knew that Milwaukee was doing; it was entirely familiar with the recommendations of the engineers who advised Milwaukee and the District upon the subject. It even sold some of its

own sludge to Milwaukee from time to time. The only excuse is that presented in these words of Pearse: 'That they (Milwaukee) had started out, I think, without utilizing the knowledge that they might have had; but we were not ready to utilize it ourselves.' The District's records disclose that as early as 1917, 'the dried sludge will have a fertilizer value' and that 'from the solids and sludge obtained there could be a fertilizer which would have considerable commercial value.'

Defendant's engineer intimated that preparation of the sludge for commercial use could be better effected by ferric chloride than by acid as was originally done at Milwaukee. The latter resorted to ferric chloride in 1929. But the suggested use of the chloride instead of acid would be of no avail to defendant as a defense against the element of savings which could be effected by preparation and sale of sludge as a fertilizer. Even if such suggested practice constituted an improvement over the patents, defendant is not relieved. "An infringer cannot be heard to say that his superior skill or intelligence enabled him to realize profits by his infringement which a person of less skill might not have realized.' *Lawther v. Hamilton, C.C.E.D. Wis.*, 64 F. 221, 224. Cf. *Westinghouse Electric Co. v. Wagner Electric Co.*, 225 U.S. 604, 614, 32 S.Ct. 691, 56 L.Ed. 1222, 41 L.R.A., N.S., 653; *Carborundum Co. v. Electric Smelting & Aluminum Co.*, 3 Cir., 203 F. 976, 982; *Conroy v. Penn Electrical & Mfg. Co.*, 3 Cir., 199 F. 427, 430; *Armstrong v. Belding Bros. & Co.*, 2 Cir., 297 F. 728, 732. He will be heard with no more patience in an endeavor to diminish liability by ascribing his profits to the capacity indwelling in a patent.' *Duplicate Corp. v. Triplex Safety Glass Co.*, 298 U.S. 448, 56 S.Ct. 792, 796, 80 L.Ed. 1274. Nor is it any defense that the inventor did not realize all the utility or all the advantages of what he invented.

In view of defendant's public character, its statutory function and the one purpose of its existence, efficient, adequate disposition of sewage with elimination or avoidance of public nuisances, certain gains or advantages arising from adoption and utilization of the activated sludge processes are significant and important in any consideration of factors entering into disposition of the question of compensation to plaintiffs. These advantages include freedom from noxious odors, putrid streams, pestilential flies. As a result, defendant achieved freedom from suits for maintaining nuisances and enjoyed the privilege of maintaining its boasted efficient plant on a comparatively small tract of land, adjacent to rapidly expanding residential districts, free of annoyance to the inhabitants. These are substantial and, in all fairness, though difficult of exact monetary valuation and elusive in character, in so far as yardsticks of measurement are concerned, must, of necessity, in order to do equity and supply legal compensation, be given consideration as factors essentially involved in such a proceeding as this.

Plaintiffs suggest that in a proper determination of damages, a reasonable royalty might well be measured by a percentage of the cost of the infringing plants. They contend that a reasonable rate on this basis would be somewhere between 5% and 10% of the total cost. Their computations \*33 are made at the rate of 6.3557% and 10% and result in the two figures, respectively, of \$2,008,499.22 and \$3,286,056.95. On the same basis, 5% would amount to \$1,643,028.47 and 7 1/2%, half way between the two extremes, to \$2,464,542.71. It might be remarked that defendant puts some reliance upon a letter written before the trial of this cause, wherein plaintiffs are claimed to have proposed settlement with infringing municipalities at 1 1/2% of plant cost 'provided settlement is made prior to decision in either the Milwaukee or Chicago suits.' This was in the nature of an offer to compromise to avoid litigation and I doubt the propriety of giving weight to it. However, 1 1/2% would produce, under plaintiffs' figures, \$492,908.54. In other words, had the offer been accepted and royalty paid in 1933, plaintiffs would have received at that time almost \$500,000 and the controversy would have then ended without protracted ensuing litigation. On the same basis, to make plaintiffs whole now on what they would have received then would require interest at 5%, the minimum legal rate in Illinois, which compounded annually, would require defendant to pay plaintiffs to make them whole in their offer then made well over \$1,000,000. Plaintiffs have been, at all times, in the unfortunate situation where they could obtain no injunction against invasion of their rights, could not stop defendant's tort, but were forced to permit continuous trespass even after the decree of infringement complained of but also for that accruing thereafter. Such a situation, it seems to me, would necessitate, in order to compensate plaintiffs, if I were to allow the alleged offer before trial, allowance also of interest thereon. In other words, where defendant has enjoyed the fruits of plaintiffs' property for more than twenty years without any rental therefor, to make an offer of royalty proposed twenty years ago compensatory twenty years later, in all fairness, would require allowance of interest or its equivalent for the intervening years. Irrespective of this self-speaking situation, a percentage of cost does not seem unfair to either side. Obviously, the difficult task is to determine the proper percentage. We have observed what 1 1/2%, 5%, 7 1/2% and 10% would produce, 3% would yield \$985,817; 4%, \$1,314,472. None of these figures shall I accept as a specific yardstick of defendant's liability, but to the fact that a reasonable royalty based upon a percentage of cost would yield plaintiffs a vast sum, I shall give consideration.

Defendant urges also in this connection that its liability should be measured by the royalty which it avers plaintiffs, or their predecessors in the chain of title,

offered to accept before trial and while the validity of the patents was still controverted. This is says was \$90,000. I doubt seriously that such an offer, made at the time and under the circumstances then existing, could afford the court any true standard of measure of defendant's liability today, after long protracted, expensive litigation with defendant's continued enjoyment of plaintiffs' property right without compensation or interest for money due. Furthermore, the offer was made in an attempt to compromise then existing controversies and was, therefore, so possessed of the attributes of an offer to compromise as to be privileged or as to avoid any binding effect upon plaintiffs thereafter in determination of the amount they are entitled to recover after all these years and intervening events. It might be observed that even that offer, with interest compounded over the intervening years during which plaintiffs have been prevented from enjoying the royalty, would at this time aggregate more than \$251,000.

Defendant also relies upon offers to settle infringements with or to grant licenses to other municipalities at various times, both before the trial herein and during the pendency of the long enduring litigation, as proper yardsticks of its liability. What I have said concerning attempts to reach a compromise is applicable to many of these offers. As to others, it is to be observed that though they, too, were in the nature of attempts to compromise, they possessed few if any of the attributes ordinarily attached to offers to sell property, either real or personal, in the open market. Though under most circumstances, in determining the value of commodities or land, weight is to be given untrammelled offers to sell in a free, open market, unrestricted by coercion of circumstances, such as lack or necessity of funds, mortgage defaults, or other unfortuitous incidents, here plaintiffs were not so environed or situated as to be able to make such a free offer. Though they owned valuable patent rights, they were confronted by resistance from powerful\***34** or responsible municipal bodies; they were well aware of the expense and uncertainty involved in litigation; they were without funds with which to combat effective resistance or to finance protracted, multiplicitous litigation. To make offers of tempting terms to settle or license in such circumstances was not to act freely, uncoerced by necessitous financial conditions. These circumstances and others appearing in the record were such, it seems to me, as of competent and credible evidence bearing upon what was a reasonable royalty when sales resistance was strong and court resistance emphatic. I recognize the fact that they were made; I give consideration to that fact, but I am unable to satisfy my conscience as a chancellor that I should credit them with decisive weight.

It might be added that some of the licenses were far from contemporaneous with the infringement of defendant. Indeed, plaintiffs seem to have been unable, as long as validity was being contested, to make any license agreements. The resistance persisted until it could no longer draw breath from any source. Then, indeed, the offers largely became attempted settlements for past infringement, which are not the proper measure. Thus, in *Rude v. Westcott*, 130 U.S. 152, 9 S.Ct. 463, 468, 32 L.Ed. 888, the court said: 'Payment of any sum in settlement of a claim for an alleged infringement cannot be taken as a standard \* \* \* in determining the damages sustained by the owners of the patent in other cases of infringement.' To the same effect is *Cornely v. Marckwald*, 131 U.S. 159, 161, 9 S.Ct. 744, 33 L.Ed. 117. *Rude v. Westcott*, supra, the court commented concerning royalties: 'In order that a royalty may be accepted as a measure of damages against an infringer, who is a stranger to the license establishing it, it must be paid or secured before the infringement complained of; it must be paid by such a number of persons as to indicate a general acquiescence in its reasonableness by those who have occasion to use the invention; and it must be uniform at the places where the licenses are issued.' See also *Dunkley Co. v. Central California Canneries*, 9 Cir., 7 F.2d 972, 976. The license contracts, whether settlement of infringing damages or free licenses made in the open market, fail to meet the requirements of determinative evidence. As I have said, I have given the fact consideration, but I have not attributed determinative character thereto.

Defendant asked of two qualified experts an answer to a hypothetical question some thirty-two typewritten pages long, to elicit an answer as to what would be a reasonable royalty. To this I sustained an objection because I deemed the interrogatory too long, lacking in many essentials of such a question, and not embracing a fair statement of defendant's proof. Such questions are, under the Rules of Civil Procedure, for the discretion of the court. *Forsyth v. Doolittle*, 120 U.S. 73, 7 S.Ct. 408, 30 L.Ed. 586. See also generally *Milwaukee & St. Paul R. Co. v. Kellogg*, 94 U.S. 469, 24 L.Ed. 256; *Schmeider v. Barney*, 113 U.S. 645, 5 S.Ct. 624, 28 L.Ed. 1130; 2 *Wigmore on Ev.*, 3rd Ed., Sec. 670, p. 792 et seq.; 3 *Jones Com on Ev.* 2d Ed., Sec. 1300, p. 2423 et seq. Without discussing the defects of the interrogatory which I think existed, it is sufficient to say that the authorities bear me out in my conclusion that it was within my discretion to deny it. However, in order that the court of review may have the entire record, I assume, for the purposes of this disposition that each of the witnesses would have testified, as defendants offered to prove, that a reasonable royalty would have been \$50,000 and I have treated the record as containing their testimony to that effect in accord with the offer of proof. And to that fact I have given

consideration but little weight. As said in *Cincinnati Car Co. v. New York Rapid Transit Corp.*, 2 Cir., 66 F.2d 592, 595: 'Though the testimony of experts was recognized as competent in *Dowagiac Mfg. Co. v. Minnesota (Moline) Plow Co.*, 235 U.S. 641, 35 S.Ct. 221, 59 L.Ed. 398, it is generally of small help.'

To defendant's offer of its Exhibits A-118 and A-124 I sustained an objection, deeming them improper for a variety of reasons. It may be, however, that the Circuit Court of Appeals may consider them admissible. Therefore, in accord with the apparent intent of Rule 43(c) of the Rules of Civil Procedure, 28 U.S.C.A. following section 723c, I have concluded to and do now admit them in evidence and include them as factors relevant to the issues under consideration.

Plaintiffs suggest that I allow extra damages, as a chancellor may ordinarily, under Section 70, Title 35 U.S.C.A. Indeed, under that statute, I may, in a proper\*35 case, award treble damages. The circumstances appearing in the record, I think, are entirely sufficient to justify such an award. I shall not repeat this evidence now, but merely state that it is fully as strong as that considered in adjudicated cases such as the Milwaukee cases where Judge Geiger commented at some length upon a similar situation, but one not as aggravated as this, where, after the Court of Appeals had affirmed the decree of validity and infringement of the patents, the defendant persisted in its trial in this cause, in an appeal, in certiorari, in an attempt to reopen the decree, in another appeal and, again, in certiorari. In *Overman Cush on Tire Co., Inc., v. Goodyear Tire & Rubber Co.*, 2 Cir., 66 F.2d 361, 362, the court said: 'The court below held that there was enough evidence, as found by the master, to support the claim that the infringement by the appellant was conscious and deliberate. There was protracted, vexatious, and expensive litigation indulged in, and obstacles were placed in the way of the appellee. (Under Section 70) the court has power, in its discretion, to increase the damages a plaintiff suffers. The exercise of that discretion will not be reversed on appeal if there be justification and reason therefor. *Wallace & Tiernan Co. v. City of Syracuse*, 2 Cir., 45 F.2d 693; *Fox v. Knickerbocker Engraving Co.*, 2 Cir., 165 F. 442.' *Motor Player Corp. v. Piano Motors Corp.*, D.C.N.J., 19 F.2d 993, 998; *Krentler-Arnold Hinge Last Co. v. Leman*, D.C. Mass., 24 F.2d 423, 425.

But, says defendant, these are exemplary damages and may not be awarded against a municipal corporation, presenting a formidable array of authorities to that effect. That such is the better rule I have no doubt. Plaintiffs reply that they are not seeking punitive damages, but increased damages with Sections 67 and 70 of Title 35, purely remedial and compensatory in character. They assert

properly I think that the statute is not penal but remedial in character and that the damages contemplated may be awarded whether the wrong was intentional or unwitting. Walker on Patents, Dellers, Ed. Sec. 835. In this respect the Act is like that provision of the Anti-Trust Act, Sec. 7, allowing treble damages. Title 15 U.S.C.A. 15 note, which is not penal. *Chattanooga Foundry & Pipe Work v. City of Atlanta*, 203 U.S. 390, 27 S.Ct. 65, 51 L.Ed. 241; *Meeker & Co. v. Lehigh Valley R.*, 236 U.S. 412, 35 S.Ct. 328, 59 L.Ed. 644, Ann.Cas. 1916B, 691. In *Sullivan v. Associated Billposter & Distributors*, 2 Cir., 6 F.2d 1000, 1009, 42 A.L.R. 503, the court said: 'The provisions above quoted are clearly remedial. \* \* \* If a statute which is penal in part gives a remedy for an injury to the person injured to the extent that it gives such a remedy it is a remedial statute, irrespective of whether it limits the recovery to the amount of actual loss sustained or as cumulative damages as compensation for the injury.' In *Momand v. Twentieth-Century Fox Film Corp.*, D.C., 37 F.Supp. 649, at page 657, the court said: 'The right of action created by Section 7 of the Sherman Anti-Trust Act, is not a penalty but remedial, and the remedy granted is to one injured in his business or property by reason of the acts forbidden in the preceding sections of the Act.' See also *Standard Oil Co. v. Universal Oil Products Co.*, D.C.N.D. Ill. E.D., 21 F.2d 159; *Standard Oil Co. v. Roxana Petroleum Corp.*, D.C.S.D. Ill. S.D., 9 F.2d 453; *Taylor v. Ford Motor Co.*, D.C.N.D. Ill. E.D., 2 F.2d 473; *Beacon Folding Machine Co. v. Rotary Mach. Co.*, D.C.D. Mass., 17 F.2d 934; *Muther v. United Shoe Machinery Co.*, D.C.D. Mass., 21 F.2d 773. In *Koehring Co. v. Foote Co., Inc.*, D.C.W.D.N.Y., 21 F.2d 569, the court said concerning the patent statute: 'my attention is now drawn to Judge Learned Hand's decision in *Grasselli Chemical Co. v. Nat. Aniline & Chemical Co., Inc.*, D.C.S.D.N.Y., 282 F. 379, wherein it was ruled that a demand for treble damages in an action for infringement of patent was not penal. \* \* \* And in *Brady v. Daly*, 175 U.S. 148, 20 S.Ct. 62, 44 L.Ed. 109, an action arising out of infringement of copyright of a dramatic composition, the Supreme Court decided that such an action, though treble damages were demanded in the bill, was not for a penalty or forfeiture. That case applies by analogy to the case at bar; indeed, the weight of authority is that the demand for treble damages in an infringement suit is remedial. \* \* \* See, also, *Beacon Folding Machine Co. v. Rotary Machine Co.*, D.C.D. Mass., 17 F.2d 934; (*Frankel v. Sears, Roebuck & Co.*, D.C.E.D.N.Y., 21 F.Supp. 1018).'

I conclude Sections 67 and 70 are remedial and not penal in character. Obviously, that does not, of itself, determine whether the damages to be allowed \*36 are punitive in character. As to that, I conclude that the extra damages recoverable thereunder may be punitive if the circumstances so warrant, but include also damages purely compensatory which are elusive but which plaintiffs

ought to recover, not as punishment but as reimbursement for what plaintiffs have actually lost. Consequently I have carefully avoided any allowance in the nature of exemplary damages and have included only compensatory damages. In this connection I have not given weight to the amount of fees of counsel but have considered the fact that the plaintiffs have been compelled to sustain long and expensive litigation.

I have not accepted all the proposed findings of fact tendered by the respected parties but I have included in this memorandum the substance of such of them as I deemed them necessary or relevant to my decision. This method has been followed in order to reduce to a minimum the voluminous protracted proposed findings and to avoid duplication of findings adopted and of those contained in this memorandum. Then, too, it eliminates findings unnecessary to a complete disposition of the issues.

In arriving at my award I have had in mind the proof as to all factors proper for consideration, including the utility, practicability and advantages of the patents, the population served, the cost of the infringing plants, the fact that substantial savings accrued to defendants from the infringing use of the patented process, the fact that plaintiffs granted licenses to others at certain figures, that offers to license defendant at certain figures were made, the facts as to settlements made with other infringers, the circumstances under which they were made, the testimony as to a reasonable royalty and all other relevant and pertinent circumstances appearing in the record. I have adhered to the rule that the allowances must be conservative; I have kept in mind that defendant is a public body and that a judgment against it can be satisfied only by the legal revenues it collects from its inhabitant taxpayers. I have thought it proper also to avoid award of exemplary or punitive damages and to confine recovery to actual compensation to the plaintiffs for that of which they have been deprived during the life of the patents and during the periods of infringement,- in other words, actual compensatory damages. As a result of this line of procedure, after mature and deliberate consideration, I have fixed plaintiffs' damages at \$950,000.

Judgment will enter for that amount and costs, payable in due course of administration of defendant's affairs.

The findings and conclusions herein contained shall be incorporated in and made a part of my more formal findings of fact and conclusions of law adopted and filed contemporaneously herewith.