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THE AUTOMOTIVE INDUSTRY: THE PROBLEMS OF INTEGRATION, SPECIALIZATION AND INTERREGIONAL CO-OPERATION[1/]

by

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SUMMARY

1. In this paper, the problems of integration and specialization in the automotive industry are presented with reference to the experience gained in the Japanese, European and United States automotive industries.

2. The main activities of an automobile manufacturer and the present-day methods used in the automotive industry, including modern design features, are enumerated.

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1/ The views and opinions expressed in this paper are those of the author and do not necessarily reflect the views of the secretariat of UNIDO.

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3. The type of work encountered in the automotive industry is suitable to developing countries; however, developing countries must avoid the faults of the European and Japanese automotive industry and should produce, by means of subregional co-operation, a multipurpose vehicle on a large scale. Co-operating countries should specialize according to the raw materials available in the country. Some countries well supplied with skilled labour could specialize in producing the bodies of sports cars.

4. The automobile industry should be established by the governments with financial assistance from United Nations organizations.

5. Developing countries should not hesitate to purchase entire second-hand plants and old-type machines. They should also make the necessary know-how available in their own countries by hiring experts from developed countries. The Japanese obtained good results in this way when they were establishing their own automotive industry thirty years ago.

6. Emphasis should be placed on the technical education of the population. Education in maintenance and repair should be considered of particular importance.

7. The automotive parts industry should be committed to rigid standards of quality and must be developed along with the automotive industry itself. Standardization of parts and nomenclature is of great importance.

Contents

Introduction

1. The automotive industry is growing more rapidly than most of the other industries in the developing countries. The Programme therefore is concerned with the relationship between the automotive industry in the developing countries, where the technological level of the automotive industry consists of the assembly of imported parts from the more advanced countries, possibly with some import-substitution [illegible] with local materials, and the technologically more advanced countries, where the automotive industry is [illegible] a combination of industries [illegible] with a considerable degree of [illegible] in the automotive industry and the problems associated with its [illegible] in the paper on the basis of these fundamental considerations.

[illegible] AUTOMOTIVE INDUSTRY

[illegible]

1. It is not an easy task to start an automotive industry in any country or region. At the time the automobile industries came into being in the United States and in Europe, [illegible] the most advanced, a glance into their history will testify to this point. The fabrication of the automobile [illegible] horse-drawn [illegible] at that time, great skill and technique were required in building [illegible] (A visit to the [illegible] on the outskirts of Lisbon, Portugal, would [illegible] this fact.) The horse was later replaced by the steam engine, then by the electric motor, and finally by the internal combustion engine. As a result of the [illegible] invention, the automobile as we know it today, came into being.

2. The development of petroleum [illegible], lubricants, electric systems, [illegible] ignition systems, and the pneumatic tire cannot be overlooked as major contributing factors in the development of the automobile. With these developments the production of the equipment, components, accessories and over 10,000 pieces of material that go into the construction of an automobile also had to keep pace. It can be said that the ease or difficulty in establishing an automotive industry in any given region or country can be predicted according to the level of the indigenous industrial development.

3. In 1933 the automobile industry was first established in Japan by the [illegible] Motor Company, Ltd. Its founder, Mr. G. Aikawa, asked the author of the present paper whether he believed the automotive industry could succeed. The author answered that there would be difficulties to encounter at the start, but in the end the industry would succeed.

4. Mr. Aikawa brought from the United States the entire old plant of Graham Paige, closed as a result of the Depression. It included all types of conveyors, forging machines, presses, a Keller's engraver, machine tools, die blocks and even sheet and other metals. Five highly qualified engineers from the United States were invited to offer technical know-how and the operation consequently [illegible] the American system. In the beginning, components were produced for [illegible] Motors but later the company started to mass production of the [illegible], at a capacity of 1,500 vehicles per month. Items such as plain bearings, radiators, wire rims and propeller shafts were manufactured at the plant, but carburettors, tires, batteries, electric equipment, windshield glass, seats etc.

were ordered from suppliers. Since all orders had to be approved by Field Study of Automotive Engines), specifications which were not well known in Japan, the suppliers had a difficult time, [illegible] to quote prices for various models, even though most similar models were available in Japan at that time. Several months were required [illegible]

5. The Japanese side also [illegible] the [illegible] of the machine manufacturing system. The plant [illegible] was designed [illegible] time, but when combined with numerous [illegible] it was difficult [illegible] such plans in many cases [illegible] one of the principal [illegible]

6. Capital and technology are the two essentials [illegible] automotive industry anywhere. Some factors will be discussed [illegible] but at this point, the main impact of [illegible] is mentioned. This is the consolidation of the design, fabrication, and assembly, and the pooling together of the parts and components [illegible] the assembly or "engine" (assembly). Justifiably economic [illegible] of the automobile is [illegible] mass-production. This division of work is [illegible] [illegible] specialized plants have their [illegible] also in the assembly plant [illegible] specialized manufacturers [illegible] assembly. [illegible] electric equipment such as the [illegible]

7. The manufacturing [illegible] manufacturing plants [illegible] very complex in character. These plants produce [illegible] some 20,000 [illegible] of numerous [illegible] 5,000 different [illegible] to produce [illegible] The plants are generally divided [illegible]

(a) Manufacturing division where engine, [illegible] parts and chassis are manufactured;

(b) Assembly division where vehicles are assembled or moved;

(c) Administrative division where operating policy is prepared. Engineering and [illegible] are made and revised, and research and new [illegible] and accounting are under [illegible]

(d) Supplementary division [illegible] such as power plant [illegible] and other [illegible]

8. The personnel requirements for the above divisions vary from [illegible] with a fairly small [illegible] to [illegible] plants employing [illegible] or even 5,000 [illegible]

discontinuity on the processed surface. Care must be taken in controlling the temperature during the operation of feeding liquid slurry. Since feeding devices without mechanisms, maintenance them satisfactorily with manpower and knowledge should be avoided.

12. The same care must be taken on the choice of the material for the mixing vessels. Corrosion which may be caused by the materials used mainly for the liquid medium available. The use of the mild steel vessels is not to be used for the slurry, both alkali and acid, the density property of the phase would also be different. The manufacturers of the chemical corporation are not available. Typical technical specifications and pre-treatment of the mixed metal by various organic substances and multi-component are required. However the physical properties of the metal used in the mixing of slurry, if a suitable gum has to be long lasting, the mixed slurry is usually thought heating. This technique of metal fabrication must be carefully, since the composition of the automobile depends primarily on sheet metal working industry.

13. Sheet metal made in the manufacture stamp mill is to form in panels, floor and shipments, welded in various sizes. The sheet metal processed using the old technique machine which can be applied to various uniform quality. In the fabricate manufacture, the quality of the metal is not be applied consistently. It is necessary to have several parts of panels in manufacture operations. Therefore by hand operation is maintained if this is more correct.

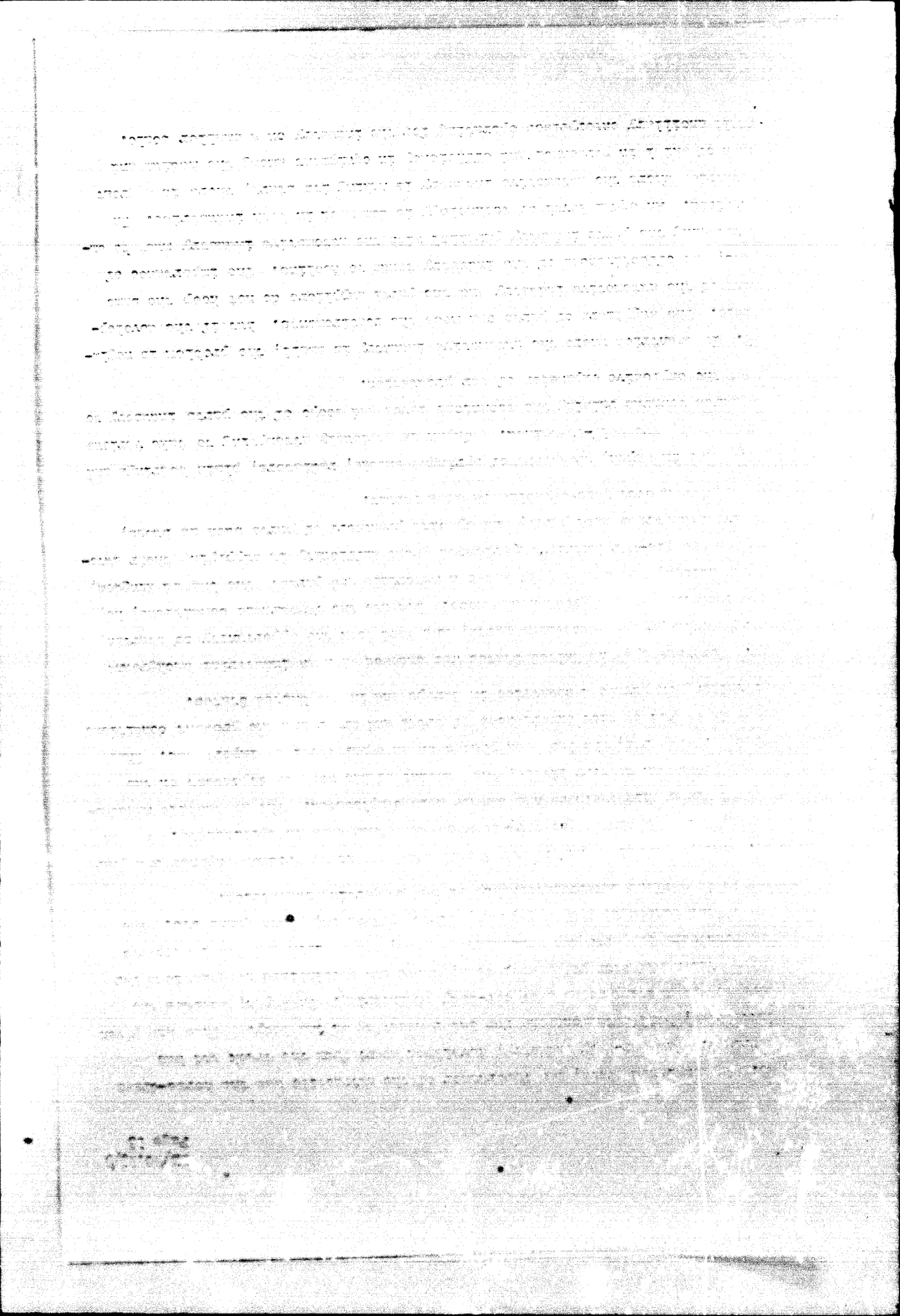
14. The making of the wheel impressions since it plays a decisive role in the life, driving and the machine. Steel is a material the manufacturer uses standards in the long run. A wheel with a well-designed tread will give the user maximum road quality automobiles with a thin plastic which may lessen the value of the product.

15. The machine shop is an important feature in today's automobile plant. The cylinder block line varies from one machine manufacturer to another. The use of a machine machine is necessary in the industry. However, the application of a small number of some is not a necessity. A unique characteristic of an automobile plant is the large array of special machine operations and part individuality. Such multi-purpose machines are used to produce precision, accuracy and quality work. The purpose of these operations are closely with little (small) part use. The use of universal and multi-purpose machines are unable to be applied in the shop. The limit means uniformity, interchangeability of products and lowered costs in the industry.

39. A laboratory serving as a guide for troubleshooting in routine work, and a research research laboratory for future innovations and development must be established. The latter, preferably united with technical centre, furnish the best equipment, instruction and highly qualified personnel, since it plays an important role in deciding the future of the product.

40. This chapter has outlined the normal workings of industrial manufacturing plants but does not deal with the duties of different types of men. This subject constitutes a complete education in itself and must be taken up at another time. The factory manager is responsible for the whole plant, but cannot do everything himself. He must delegate authority and responsibility to others. In a large concern with many departments, each under a chief, there must be co-ordination between the departments and the manager. Each department must be responsible for its own work, and while the manager must keep in touch with all departments, he must not interfere with the work of the chiefs. Each chief must be responsible for the work of his department, and must be given the authority to carry out his responsibilities. It is a mistake to make a chief responsible for work over which he has no control.

41. The successful industry is a co-operative enterprise of many individuals depending on team work. It is clearly evident from this chapter that it takes many people to make an industry. It requires not only workers, but also engineers, chemists and many others. Industries producing steel, machinery, textiles, chemicals and many other products, employ many engineers and chemists, besides, also, many workers and executives of various kinds. It takes people of many different training and temperament to make a plant, all working together, to produce goods, sell them, keep accounts, maintain and manage.



34. The plan encouraging a certain country to produce trucks only and another country only passenger cars, does not suit the various conditions in developing countries planning an automotive industry on a medium scale. If the plant is to be established under the leadership of the local government, it may be well to incorporate trucks, [illegible] production and [illegible], but at the beginning, it is [illegible] only be more produced.

35. [illegible]

36. [illegible]

37. [illegible]

38. [illegible]

(d) The technique of electric induction, which both components parts

(a) [illegible] to combat the pollution [illegible] pollutants [illegible] treatment of the [illegible] to the extent of [illegible] pollution.

(b) [illegible] to this Annex.

value. For example, a measurement given as 12.75 mm does not indicate whether or not it is made with machine tools based on inches from a factory in the United States, or from machine tools based on the metric system. The same problem is [illegible] to the adoption of a standard [illegible] of screws. There is great urgency and importance in resolving this uniformity of standards and specifications of these and other basic items. [illegible] of products for the benefit of [illegible]

[illegible]

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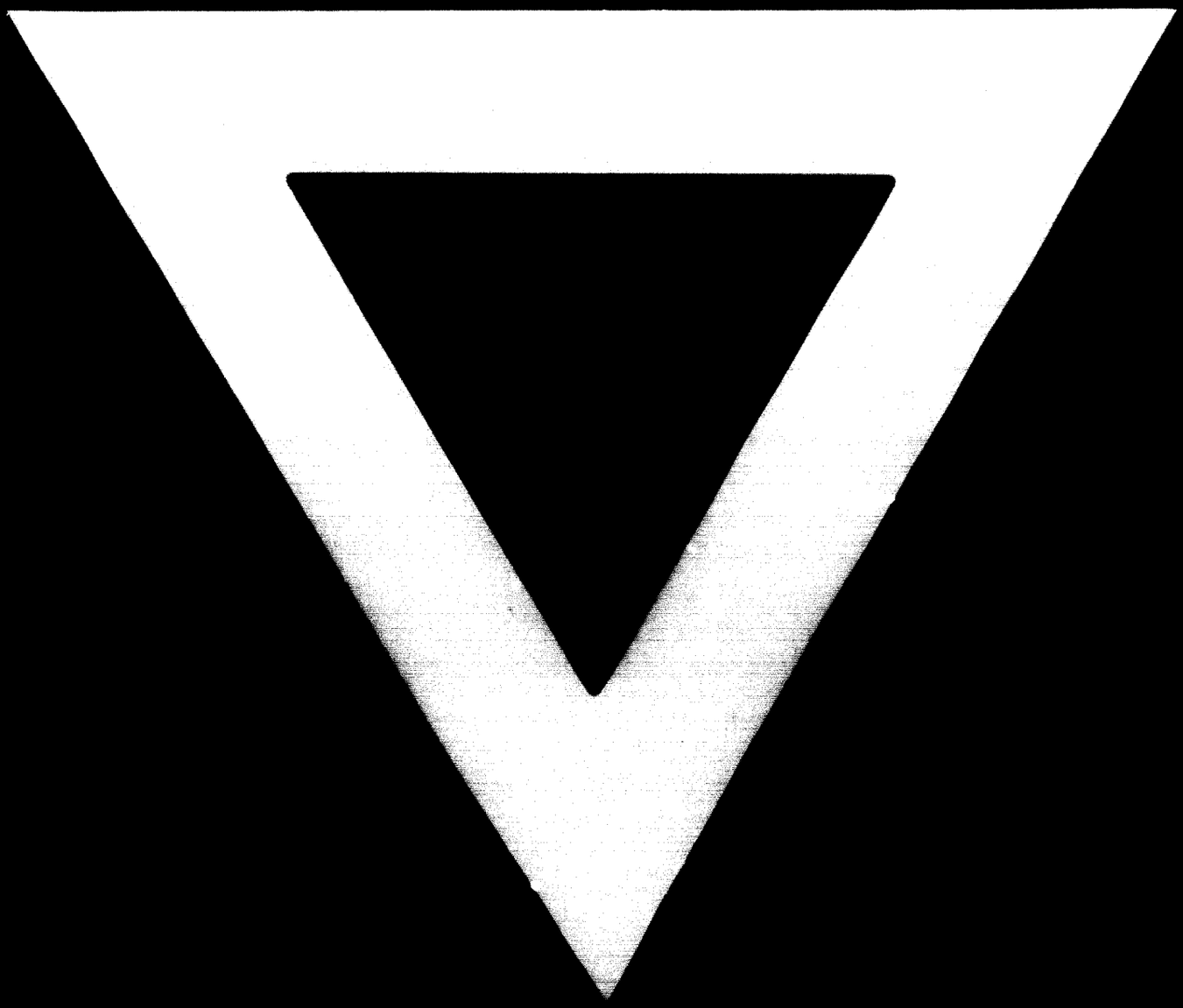

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