

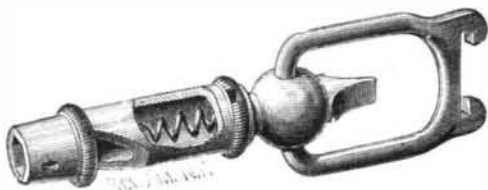
Starvation in the Nursery.

The London *Lancet* asserts as a fact of daily experience by physicians in that city, that large numbers of persons occupying decent positions in society, systematically starve their children in respect to that article of food which is most essential to their nutrition. We have reason to fear that the practice is not unknown in the nurseries of well-to-do people here. So far as our observation goes, however, the practice is attributable wholly to popular ignorance of the needs of growing children, or children that ought to be growing, but are not. The *Lancet* is of opinion that the stint is a simple meanness, a pitiful economy in respect to matters not open to the observation of observant friends. Instead of giving children their unstinted fill of milk, even though the dairyman's bill should come to nearly as much as the wine merchant's, such persons give their children cocoa with water, and not always a suspicion of milk; corn flour with water just clouded with milk; tea, oatmeal, baked flour, all sorts of materials, indeed, as vehicles of milk, but so very lightly laden with it that the term is a sham. The consequence of this misplaced economy is that there are thousands of households in which the children are pale, slight, unwholesome looking, and, as their parents say in something like a tone of remonstrance, "always delicate." Probably in nine cases out of every ten the "delicate" child is simply a child that is or has been starved.

A NEW GUN TOOL.

The novel little tool shown in the accompanying engraving comprises a whistle, screwdriver, socket wrench, shell extractor, and corkscrew combined in compact and usable form.

The tube which forms the body of the whistle is also the protector or casing of the corkscrew. The mouth of the whistle forms a socket wrench, the opposite end the screwdriver. The pendant is sprung into the bulb at the end of the whistle, and has two hooks which span the base of a center fire shell, and may be used to withdraw it from the gun should the shell retractor fail to work. A hole is drilled in the mouth of the whistle to slip over the pin of a pin fire shell when it is required to draw it from the gun. When the device is used as a socket wrench, the pendant is unscrewed



BARTHEL'S GUN TOOL AND WHISTLE.

from the whistle and reversed, the straight portion being placed in the notches in the end of the whistle tube.

This tool is a fair example of the ingenuity of Americans in economizing space and materials.

A NOVEL DOOR CHECK.

The door check shown in perspective and in section in the accompanying engraving is designed to prevent the violent shutting and slamming of doors; it is especially intended for doors that are frequently opened and closed, but may also be applied to rolling shutters, hatchway covers, etc. In this device an air cushion is employed as a means of arresting the motion of the door, and its resistance may be varied according to requirements.

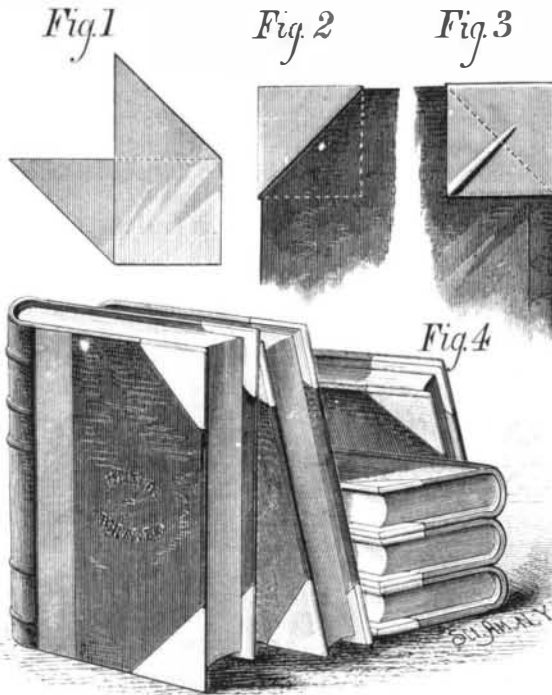
A cylinder, D, containing a piston and valves, is secured to the door casing at the hinged side of the door, and a cord which is connected with the piston rod runs over a pulley, f, at the top of the door, and is connected with a pivoted sector, G, supported by a bracket, K, projecting from the casing.

A rubber covered roller, L, turns on a stud projecting from a bracket attached to the top of the door, and rolls on one of the radial edges of the sector, G. The cylinder, D, contains a piston, E, and has at the top a valve chest inclosing two valves, M P. The valve, P, is pressed upward by a spiral spring against an adjusting screw in the cylinder head; it is designed to close the passage between the upper and lower ends of the cylinder, so as to control the escape of air from the upper to the lower end of the cylinder through the longitudinal passage shown in Fig. 2, and thus regulate the motion of the piston, E. The valve, M, is contrived so that it rises as the piston descends, and opens communication between the upper and lower portions of the cylinder. When the door is opened the piston, E, drops of its own weight, compelling the sector, G, to follow the roller, L. When the door is closing the sector and turns it on its pivot. The piston, E, is, by this means, raised against more or less air pressure, offering more or less resistance to the closing of the door. The resistance of the air may be varied by opening or closing the valve, P, by means of the adjusting screw.

This invention was recently patented by Mr. G. S. Perkins, of Hartford, Conn., from whom further information may be obtained.

A NEW PROTECTOR FOR BOOK COVERS.

The device shown in the accompanying engraving is for the temporary protection of the corners of books during handling, packing, and shipping. It is made of any thin sheet metal in the form shown in Fig. 1, and it is applied by binding the part B down over the part A, along the dotted line, and bending the part B' over it so as to



WAY & RANKIN'S CORNER PROTECTOR FOR BOOKCOVERS.

form a triangular pocket over one half of the surface of the plate, A, as shown in Fig. 2. This pocket is placed on the corner of the book cover, when the ears, B B', are pressed down firmly, completing the protector and at the same time fastening it to the book cover. The plate, A, has a diagonal stiffening rib, a, formed in it in the process of manufacture. The advantage of this device will be apparent to those who have the handling of quantities of books. A corner once injured can never be restored; the book is damaged and must be sold at a discount. The device shown in the engraving is effective, simple, and cheap, and is well calculated to protect book corners so that they cannot be injured by ordinary handling.

This invention was recently patented by Messrs. Way and Rankin. Mr. B. G. Way may be addressed at New Lisbon, O.; W. A. Rankin, at Cleveland, O.

Revolution in Tanning.

Professor Knapp proposes the use of a basic ferric sulphate instead of oak bark or other tanniferous material. He adds to a boiling solution of copperas the quantity of nitric acid requisite for the peroxidation of the iron, and after the reaction is over adds more copperas. The hides are suspended in the cold solution at a suitable degree of concentration, and are ready in from two to four days.

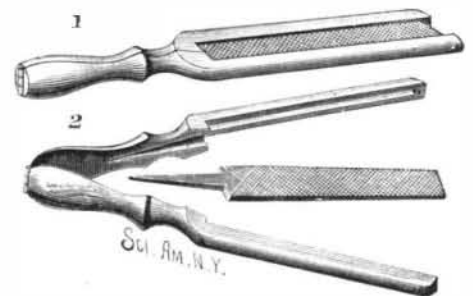
How Oysters are Freshened at Baltimore.

A new system of treating oysters is now practiced at Baltimore, by which their value is very much increased. The oysters obtained from Tangier Sound, Lynnhaven, and the kind called "seaside oysters," are rather small, although inclosed in large shells. These oysters when dredged and brought to the Baltimore market, are sold there at about 60 cents a bushel, but when freshened their value is enhanced at least 150 per cent. The manner of proceeding is somewhat different from the common practice of "floating" oysters at the East.

The oysters are transferred from the pungies on to the decks of covered scows that will each carry a deck load of about 600 bushels of oysters. The scows are then towed to a point in the Patapsco River where the water is quite shallow, and then sunk by letting water through a valve into the hold. The scows are left in this position during two flood tides, when the water is pumped out and they are then towed to the city again. The change from the salt to the fresh water swells the oysters until what were originally comparatively insignificant oysters, worth but 60 cents a bushel, become plump and luscious, fill entirely their immense shells, and command in the market from \$1.50 to \$1.60 a bushel. Two of the largest packing houses in Baltimore are engaged in this business, keeping 12 scows constantly employed. The whole operation is under the supervision of one man, who undertakes the freshening for a consideration of 10 cents a bushel, the packing houses referred to finding all the appliances.

AN IMPROVED FILE GUARD.

The accompanying engraving represents an improved file guard intended for use in mints where coins are reduced to a uniform weight by filing. It is customary to place a file on a table and remove the surplus metal by rubbing the edge of the coin on the file. As the files used in this operation must be new and sharp, the fingers are unavoidably brought into contact with the file and are soon skinned and sore. The guard shown in the engraving receives the file between its



FILE GUARD.

two halves, and, being raised a little above the surface of the file, prevents injury to the fingers.

When a file becomes worn and dull it may be readily removed and replaced by a new one.

This simple but useful device is the invention of Mary P. Ayers, of San Francisco.

RECENT ENGINEERING PATENTS.

A boiler furnace, capable of consuming smoke and gas evolved from the burning fuel, is the invention of Mr. Cyrus Smith, of Irwin's Station, Pa. It is stated that it will utilize all of the fuel and the heat generated from it.

Mr. G. T. Snyder, of Natrona, Pa., has devised a novel boiler, in which the main cylindrical portion is supported in a hollow casing or water leg, which forms the fire box. The two parts of the boiler are connected by inclined tubes.

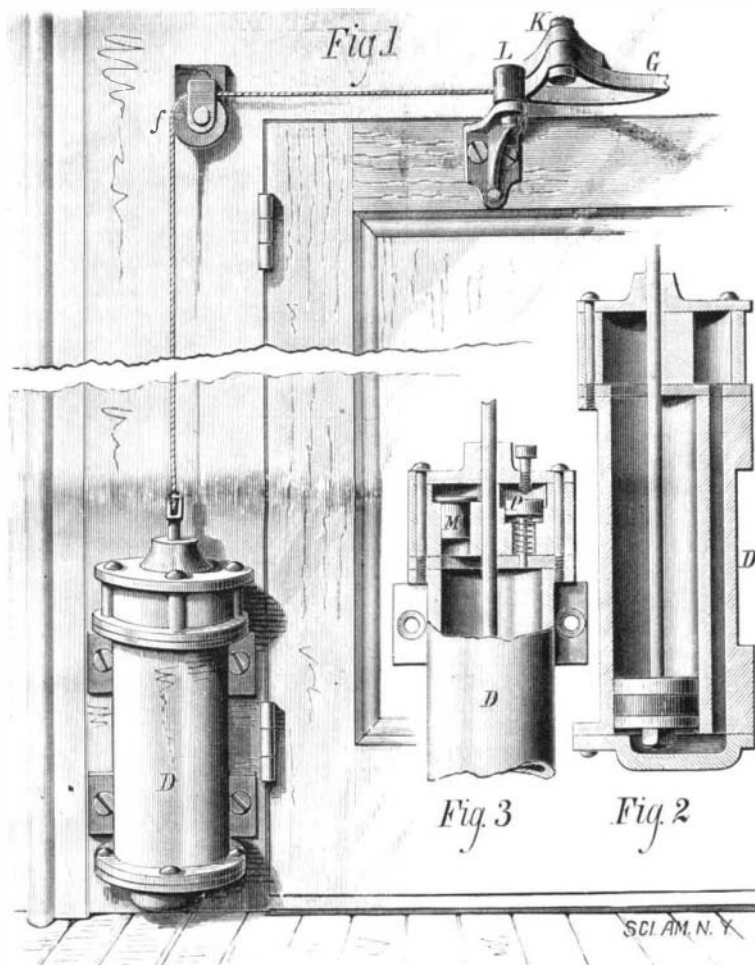
A rotary valve for steam engines, consisting of two cylindrical valves placed upon a common stem or shaft which is revolved by connection with the engine, is the invention of Mr. C. A. Knowlton, of Kankakee, Ill. The valves have a plurality of ports, and are made tapering to admit of adjustment to compensate for wear. A simple and novel reversing gear is attached.

An improved tool for cutting flues out of boilers has been patented by Mr. J. H. McGraw, of Oswego, N. Y. The tool head carries revolving cutters, and may be inserted in the tube and expanded by a wedge pin while it is turned by a wrench to cut the flue.

Mr. C. Schirrmeister, of Brooklyn (E. D.), N. Y., has invented an improvement in sewers which is designed to prevent the back flow of sewage, and in this way to prevent the driving out of noxious gases.

An improvement in angloimeters, devised by Mr. J. V. Capeck, of New York, N. Y., consists of a series of proportional wheels, having pointers and dials. The wheel train is connected with a wheel upon which a telescope or pointer is mounted.

Mr. P. Bardou, of Galveston, Texas, has patented a water tank which is formed of wood, with cleated seams and corner strips, the whole being coated with asphaltum, so that the wood is not affected by moisture.



PERKINS' DOOR CHECK

The Planet Mars.

Professor Lockyer is of the opinion that human life on the planet Mars may be very much like human life on the earth. The light cannot be so bright, but the organs of sight may be so much more susceptible as to make the vision quite as good. The heat is probably less, as the polar snows certainly extend further, but by no means less in proportion to the lessened power of the solar rays. The professor agrees with others that several remarkable seas—including inland seas, some of them connected and some not connected by straits with still larger seas—are now definable in the southern hemisphere, in which, as in the case also with the earth, water seems to be much more widely spread than in the northern hemisphere. There is, for example, a southern sea exceedingly like the Baltic in shape; and there is another and still more remarkable sea, now defined by the observation of many astronomers—one near the equator, a long straggling arm, twisting almost in the shape of an S laid on its back, from east to west, at least 1,000 miles in length, and 100 miles in breadth.

Does Invention Discourage Labor?

Burdette, of the Burlington *Hawkeye*, gravely remarks that it is a noticeable fact that the people in the prairie country of Iowa do more work than any other people in the West. This is because there is nothing about the top rail of a barbed wire fence that invites men to sit on it and talk politics while the grasshoppers get in the crops.

A NEW RATCHET DRILL.

The compact and useful tool shown in the accompanying engraving is made by the well known tool manufacturers, Messrs. Pratt & Whitney, of Hartford, Conn. This ratchet drill is contrived so that it will receive either twist drills or common drills. The handle is drop-forged of tough wrought iron; the spindle, of steel, has substantial ratchet teeth cut in its periphery, engaging with a pawl in the handle, which covers both pawl and ratchet, and protects them from dirt. The steel feed screw is of large diameter and hollow; being hardened, it is not liable to injury in ordinary use. This arrangement gives the drill large capacity in small compass, the length from the top of the feed screw to the bottom of the drill collet being only five inches. By transferring the collet and feed screw, as arranged for right hand drilling, to the opposite ends of the spindle, the ratchet may be used for left hand drilling. This feature will be appreciated by practical men.

Each drill is provided with four sockets for adapting it to the various sizes of twist drills, and to the ordinary drill having a square shank. The larger sockets are held in the spindle by a screw thread; the smaller sockets are fitted to the larger ones, and may be forced out by turning the feed screw until it bears upon their inner end. The feed rod, when not in use, is placed in the handle and held by a screw thread.

The Origin of Comets.

In the exposition of his theory of the development of the solar system, Kant supposes the comets to be formed from the matter of the condensing solar nebula. By him they were regarded as planets, which, in some way, had been thrown out of their normally circular orbits. Laplace, on the other hand, in his exposition of the nebular hypothesis, took the ground that comets were formed from the matter which is scattered through the stellar spaces, and that in their origin they have no relation with the solar nebula. Have we, in the accumulation of facts since the days of Kant and Laplace, learned anything that may help us to decide between these theories? Such is the inquiry proposed by Prof. H. A. Newton, who, in a recent number of the *American Journal of Science and Arts*, considers: First, what peculiarities each of them requires in the shape and distribution of the cometic orbits; and, second, compares with the theories the facts that have been observed with regard to the paths of 247 comets. The cometic paths are represented by the writer in two graphic curves, and when the results of actual observations are put into the same form, it is at first found that the curve thus obtained differs from both the theoretical ones. However, as the known comets all have their perihelion (that part of their orbit nearest the sun) within the orbit of Mars, and are exposed to planetary disturbances, the author calculates the influence of these disturbances, and arrives at the conclusion that the curve corresponding to the actual cometary paths is thus brought into good agreement with the theoretical curve deduced from Laplace's hypothesis, whereas it does not agree so well with that deduced from Kant's. It would seem, then, that the origin of comets must be placed in interstellar space.

New View of Infection.

The theory that very small organisms, either vegetable or animal, are the cause of all infectious diseases is very generally accepted at the present day. It passes as established and almost mathematically proven, because this theory alone is able to explain for us a series of phenomena that would otherwise be totally inexplicable. Hence the alpha and

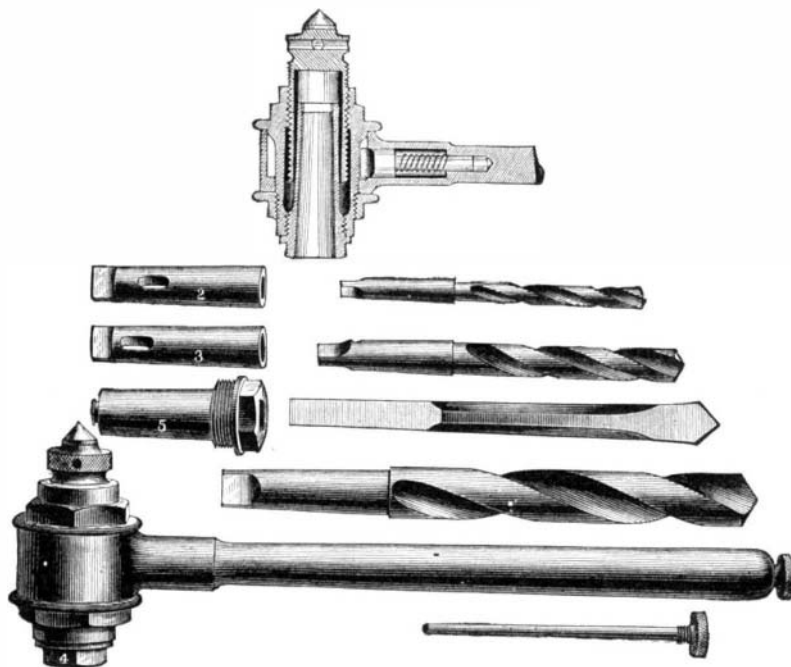
omega of all precautions directed against infectious diseases and epidemics consist in combating and destroying these organisms.

C. Von Nägeli, a Bavarian investigator of some repute, makes a decided objection to this theory, and offers a new view, of great practical and hygienic importance. He retains the idea that the smallest organisms (*pilze*), fungi, are the cause of all infectious diseases, but he holds that only those germs are dangerous and calculated to infect which enter our organs of respiration with the air we breathe. This is the peculiarity of his theory.

He considers, on the other hand, that infection through the unbroken skin, or through the digestive organs by means of water or food, is impossible. It cannot be denied that there are important reasons advanced to substantiate this view. It is established that we often partake of great quantities of different kinds of fungi in our food without any injury.

It is sufficient to mention the high game (*haut gollt*), Roquefort cheese, vinegar pickles, and many other kinds of food enjoyed by whole classes of people. Bad drinking water, so much decried as unsanitary, does not contain any products of decomposition other than those found in the above described foods. There are also examples in large territories, as in the Karat, where the people are accustomed throughout life to drink bad water exclusively, and yet infectious diseases are almost unknown among them.

If Von Nägeli's theory should prove true and find general acceptance, it would cause a total revolution in the principles of public regimen and sanitation, and in their practical application. Then it would be no longer necessary to trouble ourselves about the generation of products of decay in masses of liquid, as in sewers, canals, damp soil, river and spring waters. On the other side every means must be employed to prevent these fungi diffusing through the air as a result of the drying up of such decaying masses.



RENSHAW'S RATCHET DRILL.

These are, in a few words, the foundation of Nägeli's new theory, and its immediate result. The theory will meet with much opposition, and we cannot say we are pleased with the prospects which its practical results offer, or threaten, we might say. So far as we are aware, the facts are so strongly against the use of putrid water, that the attempt to use it would be attended with too much danger to encourage it. As chroniclers of the latest theories, true or false, which affect so intimately the welfare of mankind, we feel bound to present its salient features, and recommend those who feel any special interest in the subject to procure the author's little book entitled "Die niederen Pilze in ihren Beziehung zu den Infektionskrankheiten."

Lake Superior Copper.

In the counties of Houghton, Keweenaw, Ontonagon, and Isle Royale, Michigan, 37 copper mines were in operation during 1878. The output exceeded by 20,000 tons the yield of any previous year. More than half the entire product came from the Hecla & Calumet mine. This mine employs regularly about 2,000 men, and each successive year shows a larger product. Last year it turned out 12,500 tons of refined copper, worth over \$4,000,000. The mine was opened in 1868, and has already divided among its shareholders \$14,650,000, retaining a surplus of \$3,000,000.

How to Distinguish Diamonds.

M. Rabinet, of the French Academy of Sciences, gives the following test for distinguishing colorless gems from diamonds. If a person looks through a transparent stone at any small object, such as the point of a needle, or a little hole in a card, and sees two small points, or two small holes, the stone is not a diamond. All white colorless gems, with the exception of the diamond, make the object examined appear double; in other words, double refraction whenever exhibited by a stone, is conclusive proof that it is not a diamond.

Physical Consequences of Death.

While critically reviewing, in *Nature*, a very suggestive though decidedly speculative volume entitled "Paradoxical Philosophy" (a sequel to the "Unseen Universe," and evidently by the same authors), the learned university professor of experimental physics at Cambridge, England, Prof. J. Clerk Maxwell, takes occasion to discuss with characteristic acuteness the position of science with respect to the physical consequences of death. He says:

"No new discoveries can make the argument against the personal existence of man after death any stronger than it has appeared to be ever since men began to die, and no language can express it more forcibly than the words of the Psalmist: 'His breath goeth forth, he returneth to his earth; in that very day his thoughts perish.'

"Physiology may supply a continually increasing number of illustrations of the dependence of our actions, mental as well as bodily, on the condition of our material organs, but none of these can render any more certain those facts about death which our earliest ancestors knew as well as our latest posterity can ever learn them.

"Science has, indeed, made some progress in clearing away the haze of materialism which clung so long to men's notions about the soul, in spite of their dogmatic statements about its immateriality. No anatomist now looks forward to being able to demonstrate my soul by dissecting it out of my pineal gland, or to determine the quantity of it by the process of double weighing. The notion that the soul exerts force lingered longer. We find it even in the late Isaac Taylor's 'Physical Theory of a Future State.' It was admitted that one body might set another in motion; but it was asserted that in every case, if we only trace the chain of phenomena far enough back, we must come to a body set in motion by the direct action of a soul.

"It would be rash to assert that any experiments on living beings have as yet been conducted with such precision as to account for every foot-pound of work done by an animal in terms of the diminution of the intrinsic energy of the body and its contents; but the principle of the conservation of energy has acquired so much scientific weight during the last twenty years that no physiologist would feel any confidence in an experiment which showed a considerable difference between the work done by an animal and the balance of the account of energy received and spent.

"Science has thus compelled us to admit that that which distinguishes a living body from a dead one is neither a material thing, nor that more refined entity, a 'form of energy.' There are methods, however, by which the application of energy may be directed without interfering with its amount. Is the soul like the engine driver, who does not draw the train himself, but, by means of certain valves, directs the course of the steam so as to drive the engine forward or backward, or to stop it?

"The dynamical theory of a conservative material system shows us, however, that, in general, the present configuration and motion determines the whole course of the system, exceptions to this rule occurring only at the instants when the system passes through certain isolated and singular phases, at which a strictly infinitesimal force may determine the

course of the system to any one of a finite number of equally possible paths, as the pointsman at a railway junction directs the train to one set of rails or another. Professor B. Stewart has expounded a theory of this kind in his book on 'The Conservation of Energy,' and MM. de St. Venant and Boussinesq have examined the corresponding phase of some purely mathematical problems.

"The science which rejoices in the name of 'Psychophysik' has made considerable progress in the study of the phenomena which accompany our sensations and voluntary motions. We are taught that many of the processes which we suppose entirely under the control of our own will are subject to the strictest laws of succession, with which we have no power of interfering; and we are shown how to verify the conclusions of the science by deducing from it methods of physical and mental training for ourselves and others.

"Thus science strips off, one after the other, the more or less gross materializations by which we endeavor to form an objective image of the soul, till men of science, speculating in their non-scientific intervals, like other men, on what science may possibly lead to, have prophesied that we shall soon have to confess that the soul is nothing else than a function of certain complex material systems.

"Men of science, however, are but men, and therefore occasionally contemplate their souls from within. Those who, like Du Bois-Reymond, cannot admit that sensation or consciousness can be a function of a material system, are led to the conception of a double mind:

"On the one side the acting, inventing, unconscious, material mind, which puts the muscles into motion, and determines the world's history; this is nothing else but the mechanics of atoms, and is subject to the causal law; and, on the other side, the inactive, contemplative, remembering, fancying, conscious, immaterial mind, which feels pleasure and pain, love, and hate; this one lies outside of the me-