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SEAT AND ORIGIN OF PAIN.

Pain is so habitually associated with the nerves that it may seem at first absurd to speak of its having its seat and origin anywhere else. We know that one grand function of the general nervous system is to transmit sensation, which, when it is unpleasant, we call pain. We know that the posterior roots of the spinal nerves have this apparently for their exclusive function. This cannot be denied, and yet we find a factor of so much greater significance and power in respect to the existence and the degree of pain, that though its transmission is dependent on nerve fibers only, we may fairly say that its seat and origin are beyond, and are truly not physical at all. Pain is mental.

Of course we do not intend by this to assert that there is no physical pain, but we do assert that apart from mental activity the degree of pain which exists throughout the domain of animal life is relatively so much less than what our sensations induce us to believe that, if we were able to eliminate the mental element in our experience, the pains we so often bear would lose, not their existence certainly, but most surely all their severity. We propose to show our reasons for such a belief.

The first point is this: all animals of lower grade than human suffer very much less pain from physical injuries than our own sensations convey to us. We can readily see the proof of this in their habitual actions. Many of the starfishes detach parts of their arms, at the very smallest provocation, and remain uninjured by the change or loss. The Holothurians pinch their bodies by contractions of their circular muscles until the posterior portions drop off in successive fragments and perish. This they would scarcely do if the process involved pain.

But leaving the invertebrates, and ascending to the fishes, it is a fact well known to all anglers that a fish which has torn away the hook from a line in its struggles to escape will take the bait again as soon as its fright has passed off, and while the hook still remains in the jaw which it has perforated. Catching a swell-fish (*Tetodon turgidus*) in shallow water, and dropping it overboard as of no value, you may any day see it swim straight to the bottom and take your bait as quick as it reaches there. In "cutting in" a whale in the low latitudes, sharks swarm around eager for food. As they may cause danger to the two men who are at work on the body of the whale, it is customary to place a man on watch with a whaling-spade to drive them away. It is great fun for him, and he chops the sharks without mercy. Very often a vigorous blow of his keen-edged spade lays the whole side of a shark open, leaving his intestines exposed and floating out from his abdomen as he swims, and yet this does not stop him or seem at the first to cause him any special annoyance, for he snaps up every bite of blubber he can get as readily as before.

But it may be said that these are cold-blooded animals, and probably very little sensitive. Turning, then, to a grade much higher, a single incident may suffice to illustrate our point as well as a detail of many others could do. One day a young deer was brought into camp whose fore leg had been broken by a shot. In the hope of saving it for a children's pet, we decided to amputate the leg near the shoulder. No chloroform was at hand, and the amputation was made without any anaesthetic. This very subject of pain in animals we had in careful consideration at the time, and we watched for its manifestation. But scarcely the slightest sign of it was apparent. The eye of a deer is singularly expressive; and if any faith can be placed in such tokens, the actual pain which that fawn experienced during the operation was certainly very slight.

Once more, and coming still higher, we recognize the fact, which is perfectly well known, that savages of the human race pay small attention to injuries at which our more polished classes would manifest intense suffering. It may be said that it is because they take pride in enduring the pain, and therefore make no manifestations. This may possibly be true in some cases, as for instance in the presence of hostile assailants, etc., but other circumstances show quite conclusively that they really feel the pain in only small measure. One of the missionaries in Damara-land stated, not long since, that the natives there are constantly covered with blisters which to us would be fearfully distressing, but which they almost totally disregard. The origin of the blisters is the curious point. They crowd up so closely to their camp fire, for the sake of the pleasant warmth, that the skin is burnt before they become conscious of the fact, and the heavy blisters are the result.

Still again, every surgeon sees convincing proof in his daily experience that the sensitiveness of his various patients varies so widely that there must be some cause for it beyond that which is physical. There is no such wide diversity in the nerve tissue of their systems, either of the cells of gray matter or the fibers of white matter, as can account for the extreme differences with which they not only manifest pain, but with which they doubtless feel it; and he also knows well that the mental attention may be assuredly so totally abstracted as that the body shall be completely insensible to pain.

Now, we by no means propose to encourage "cruelty to animals" because we argue that they suffer less than has been commonly supposed. The old statement, that when we step on a worm we cause it as great a pang "as when a giant dies" (Query: why giant?), may stand well in poetry, and serve a good purpose. We only put forth these views as having an important physiological and psychological import.

THE EXHAUSTION OF THE PUBLIC DOMAIN.

We think the facts stated in an article in the January (1886) number of the *North American Review*, entitled "Landlordism in America," demand the grave and careful consideration of all who have believed in the possibilities of a better government on this continent than any yet attained in Europe.

It will be a matter of almost startling surprise to most people, and to many who are much better informed than the average, that out of 25,560,000 acres "of arable public lands, which could be cultivated without irrigation or other artificial appliances," possessed by the government in 1879, not more than 5,000,000 acres remain.

But this rapid absorption of the land would not be so serious a matter—in fact, would be a subject of congratulation—had the fertile regions so rapidly taken up passed into the hands of industrious farmers in plots of 160 acres, as the government originally intended. Unfortunately, this is not the case.

It seems almost that the gospel of greed has taken fatal possession of the people of this country. The tricks, subterfuges, and frauds by which laws intended to be beneficent have been wrested from their purpose—for instance, the timber culture, pre-emption, and desert laws—and made to play into the hands of unscrupulous speculation; the laxity of public administration, the careless and unscrupulous legislation, by which territory large enough for an empire has been made over to irresponsible corporations, form a chapter in American history which will not shed a halo of glory upon our institutions in future ages; and all the more will this darken the page, since we had the example of Rome, England, and Germany to warn, and that of France to instruct us, both as to the danger of the absorption of small holdings by land monopolists and the creation of a class of tenant farmers, and the value to a nation of a rural population of actual owners of small farms.

The author of the article shows from the census that five years ago "the total number of persons engaged in agriculture was 7,670,493, of which only 2,984,306 are registered as the nominal owners of their holdings." The rest are "tenants paying rent to landlords, or agricultural laborers." It is well known that the next census will show a large increase in the number of tenant farmers. Contrast this with the status of France, which, with a population of 12,000,000 less than that of the United States, has 5,000,000 rural proprietors holding less than 20 acres apiece and working their holdings with their own hands, and 2,000,000 proprietors of holdings of more than 20 acres apiece. An array of most important facts besides those to which we have directed especial attention are presented; but the most un-American feature of the entire business is the obtaining through indirect methods of large tracts of lands by foreigners who do not reside in the country, and some of whom do not even pay taxes here, these lands being let out to tenants with all the pleasant features of landlordism in England and Ireland.

One notable instance is cited—that of an "Irishman who has earned an unpleasant notoriety as a landlord in his own country." This man owns over 80,000 acres of land, 40,000 acres being in one county, and derives over \$100,000 cash rental from the estate, which is sent to him to spend in England, where he resides. The tenants are required in their leases to pay the taxes on the property occupied by them.

We cannot give space to further comments upon the important and timely publication of these facts and figures, which show, however surprising the statement may be, that America possesses now the largest class of tenant farmers of any existing nation.

Paper Pipes.

In Vienna there were recently exhibited gas and water service pipes made of paper. The same kind of pipes will do for many factory purposes, and for laying electrical wires, etc., we should suppose it to be specially useful. The pipes, according to the *Paper World*, are made as follows: Strips of paper are taken, the width of which corresponds with the length of one pipe section. The paper is drawn through melted asphalt, and wound upon a mandrel which determines the inner diameter of the pipe. When the pipe thus made has cooled, it is pulled off the mandrel and the inside is covered with a kind of enamel, whose nature is kept secret by the makers. The outside is painted with asphalt varnish, and dusted over with sand. It is stated that such a pipe will resist some 2,000 pounds internal pressure, though the thickness of the stuff is only about half an inch.