we may regard nocuous stimuli as part of a normal state of affairs. It does not seem improbable, therefore, that there should under selective adaptation attach to the skin a so-to-say *specific sense of its own injuries.* As psychical adjunct to the reactions of that apparatus we find a strong displeasurable effective quality in the sensations they evoke. This may perhaps be a means for branding upon memory, of however rudimentary kind, a feeling from past events that have been perilously critical for the existence of the individuals of the species. In other words, if we admit that damage to such an exposed sentient organ as the skin must in the evolutionary history of animal life have been sufficiently frequent in relation to its importance, then the existence of a specific set of nerves for skin-pain seems to offer no genetic difficulty, any more than does the clotting of blood or innate immunity to certain diseases. That these nerve-endings constitute a distinct species is argued by their all evoking not only the same species of sensation, but the same species of reflex movement as regards "purpose,” intensity, resistance to “ shock,” &c. And their evolution may well have been unaccompanied by evolution of any specialized end-organ, since the naked free nerve-endings would better suit the wide and peculiar range of stimuli, reaction to which is in this case required. A low threshold was *not* required because the stimuli were all intense, intensity constituting their harmfulness; but response to a wide range of stimuli of *different* kinds was required, because harm might come in various forms. That responsive *range* is supplied by naked nerve itself, and would be cramped by the specialization of an end-organ. Hence these nerve-endings remained free.

It is those areas, stimulation of which, as judged by analogy, can excite pain most intensely, and it is those stimuli which, as judged by analogy, are most fitted to excite pain which, as a general rule, excite in the “ spinal ” animal—where pain is of course non-existent—the *prepotent* reflexes. If these are reactions to specific pain-nerves, this may be expressed by saying that the nervous arcs of pain-nerves, broadly speaking, dominate the spinal centres in peculiar degree. Physical pain is thus the psychical adjunct of an imperative protective reflex. It is preferable, however, since into the merely spinal and reflex aspect of the reaction of these nerves no sensation of any kind can be shown to enter, to avoid the term “ pain-nerves.” Re­membering that the feature common to all this group of stimuli is that they threaten or actually commit damage to the tissue to which they are applied, a convenient term for application to them is *nocuous.* In that case what from the point of view of *sense* are cutaneous pain-nerves are from the point of view of *reflex-action* conveniently termed *noci-ceptive* nerves.

In the competition between reflexes the noci-ceptive as a rule dominate with peculiar certainty and facility. This explains why such stimuli have been so much used to evoke reflexes in the spinal frog, and why, judging from them, such “ fatality ” belongs to spinal reflexes.

One and the same skin surface will in the hind limb of the spinal dog evoke one or other of two diametrically different reflexes according as the mechanical stimulus applied be of noxious quality or not, a harmful insult or a harmless touch. A needle-prick to the planta causes invariably the drawing up of the limb—the flexion-reflex. A harmless smooth contact, on the other hand, causes extension—the extensor-thrust above described. This flexion is therefore a noci-ceptive reflex. But the scratch-reflex—which is so readily evoked by simple light irritation of the skin of the shoulder—is relatively mildly noci-ceptive. When the scratch-reflex and the flexion-reflex are in competition for the final neurone common to them, the flexion-reflex more easily dispossesses the scratch-reflex from the final neurone than does the scratch-reflex the flexion-reflex . If both reflexes are fresh, and the stimuli used are such as, when employed separately, evoke their reflexes respec­tively with some intensity, in my experience it is the flexion-reflex that is usually prepotent'. Yet if, while the flexion-reflex is being moderately evoked by an appropriate stimulus of weak intensity, a strong stimulus suitable for producing the scratch­-reflex is applied, the steady flexion due to the flexion-reflex is replaced by the rhythmic scratching movement of the scratch-reflex , and this occurs though the stimulus for the flexion-reflex is maintained unaltered. When the stimulus producing the scratch is discontinued the flexion-reflex reappears as before. The flexion-reflex seems more easily to dispossess the scratch-reflex from the final common paths than can the scratch-reflex dispossess the flexion-reflex. Yet the relation is reversible— by heightening the intensity of the stimulus for the scratch-reflex or lowering that of the stimulus for the flexion-reflex.

In decerebrate rigidity, where a tonic reflex is maintaining contraction in the extensor muscles of the knee, stimulation of the noci-ceptive arcs of the limb easily breaks down that reflex. The noci-ceptive reflex dominates the motor neurone previously held in activity by the postural reflex. And noci-ceptive reflexes are relatively little depressed by “ spinal shock.”

Noci-ceptive arcs are, however, not the only spinal arcs which in the intact animal, considered from the point of view of sensation, evoke reactions rich in affective quality. Beside those receptors attuned to react to direct *noxai* the skin has others, concerned likewise with functions of vital importance to the species and colligate with sensations similarly of intense affective quality; for instance, those concerned with sexual functions. In the male frog the sexual clasp is a spinal reflex. The cord may be divided both in front and behind the brachial region without interrupting the reflex. Experiment shows that from the spinal male at the breeding season, and also at other times, this reflex is elicited by any object that stimulates the skin of the sternal and adjacent region. In the intact animal, on the contrary, other objects than the female are, when applied to that region, at once rejected, even though they be wrapped in the fresh skin of the female frog and in other ways made to resemble the female. The development of the reflex is not prevented by removal of the testes, but removal of the seminal reservoirs is said to depress it, and their distension, even by indifferent fluids, to exalt it. If the skin of the sternal region and arms is removed the reflex does not occur. Severe mutilation of the limbs and internal organs does not inhibit the reflex, neither does stimulation of the sciatic nerve central to its section. The reflex is, however, depressed or extinguished by strong chemical and pathic stimuli to the sternal skin, at least in many cases. The tortoise exhibits a similar sexual reflex of great spinal potency.

It would seem a general rule that *reflexes arising in species of receptors which considered as sense-organs provoke strongly affective sensation* caeteris paribus *prevail over reflexes of other species when in competition with them for the use of the “final common path.*" Such reflexes override and set aside with peculiar facility reflexes belonging to touch organs, muscular sense-organs, &c. As the sensations evoked by these arcs, *e.g. “* pains,” exclude and dominate concurrent sensations, so do the reflexes of these arcs prevail in the competition for possession of the common paths. They seem capable of *pre­eminent intensity* of action.

Of all reflexes it is the tome reflexes, *e.g.* of ordinary posture, that are in the writer’s experience the most *easily* interrupted by other reflexes. Even a weak stimulation of the noci-ceptive arcs arising in the foot often suffices to lower or abolish the knee-jerk or the reflex extensor tonus of the elbow or knee. If various *species* of reflex are arranged, therefore, in their order of potency in regard to power to interrupt one another, the reflexes initiated in receptors which considered as sense­organs excite sensations of strong affective quality lie at the upper end of the scale, and the reflexes that are answerable for the postural tonus of skeletal muscles lie at the lower end of the scale. One great function of the tonic reflexes is to main­tain habitual attitudes and postures. They form, therefore, a nervous background of active equilibrium. It is of obvious advantage that this equilibrium should be easily upset, so that the animal may respond agilely to the passing events that break upon it as intercurrent stimuli.

*Results.—*Intensity of stimulation, fatigue and freshness,