

ASCAP NEWSLETTER

Across-Species Comparisons And Psychiatry Newsletter

Volume 4, No. 2, 15 February 1991

"Twice we saw dominant lizards defeated and humiliated... they lost their majestic colors, turned muddy brown, became depressed and died two weeks later" P. McLean¹

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For the philosophy guiding this newsletter, predicated upon combinations of top-down and bottom-up analyses, see footnote on p11³

Newsletter aims:

1. A free exchange of letters, notes, articles, essays or ideas in whatever brief format.
2. Elaboration of others' ideas.
3. Keeping up with productions, events, and other news.
4. Proposals for new initiatives, joint research endeavors, etc.

Features; This issue mostly features Tyge Schelde's reply to John Price's essay in the July ASCAP (vol 3) This essay, starting p2, is worth its length, coming as it does from a psychiatric ethologist systematically observing and recording data on depressed persons. Moreover, therapeutic suggestions have emerged.

Renewed Announcement: We reiterate the plans for the two day London-Sussex meeting on July 7 & 8, 1991, of the fourth meeting of the Basic Plan Group, but the first with John Price. For those planning to come who have not yet touched base, please let me know.

Comment: How interesting to read/see accounts of the Persian Gulf war (these seem to be another form of a less quantitative human ethology which much of the world now seems to practice). Despite the bombing, Saddam seems hardly humiliated. Humans have ways of staying victorious despite defeat. Also, recall Price's depressed patients who may "get their

way" and hence stay somewhat victorious even though covertly so! Is it partly for this ability to compromise and compensate that humans developed bigger brains than lizards?

Errata; Omissions were made in transcribing John Price's reply to A Randrup and G Sorenson in the Jan issue of ASCAP. (The transcriber newly had bifocals and sends her apologies to Dr Price!). The omitted portions were on col 2 of p3 and col 1 of p4. The sentences as they were intended are here copied with the omissions italicized: "Other males occupy the space between the territories and *do not relate to any females. There is little fighting and the territorial males do not try to mate with each other's females, even if they stray onto their territories.*" "It seems that some animals like the wolf and the rhesus monkey have an innate capacity for submission, *others like the guinea pig have the capacity to learn submission, others like the tree shrew and the male patas monkey lack the capacity to learn submission.*" "The other is that the corticosteroid response to the stress of fighting is part of a feed-back loop which triggers the decision to lose in the eventual loser; this would fit in with the ideas of Leshner and his findings that adrenalectomized mice show *delayed losing, and normal mice injected with ACTH or cortisone show exaggerated losing behaviour.*"

Price-Schelde Exchange; Depression, Submission, and Ethologically Based Therapies by T Schelde⁴

Abstract:

This paper focuses on behavioural markers and parameters of endogenous depression and correlates of improvement (recovery) along with specifically defined submissive behaviours. Are endogenously depressed patients submissive according to a proposed definition? Moreover, are patients recovered from endogenous depression more submissive than normals? A submission/yielding hypothesis of depression is elucidated as well as a submission/aggression paradox of the depressive syndrome. Finally, might behavioural strategies diminish risk of severe depression?

Introduction

Ethological psychiatry is a new research discipline only 2.5 decades old. Behaviour of patients when studied in natural or semi-natural environments (eg, hospital wards) provides new more precise information for relating behaviour to psychic state. Since Grant's studies in 1968⁶ the field has developed especially via the theory and investigations carried out by McGuire⁷ in the 1970s and early 1980s. Fossi⁸, Pederson⁹, and Schelde¹⁰ have taken special interest in establishing behavioural markers of endogenous depression and improvement. Bouhuys¹¹, Troisi¹², Fisch¹³, Dixon¹⁴, and Nilsonne¹⁵ have also carried out relevant studies on depression-related behaviour.

This essay answers JS Prices's 'Metaphors of Submission' from the July ASCAP Newsletter and focuses on the following two questions:

1. Are endogenously depressed patients submissive?
2. Can endogenous depression evolve as an involuntary yielding component of ritual agonistic behaviour?

Eight points answer or elucidate these questions:

1. Behavioural markers of endogenous depression and improvement.

The depressive syndrome seems imprecisely defined, as it ranges from sadness, reactive depression, and

neurotic depression to agitation and endogenous depression (melancholia). However, the works of Polsky and McGuire¹⁷, Fossi, Pedersen, and Schelde, made it obvious that endogenous depression and the following state of recovery can be clearly described behaviourally. The general hypothesis from a pilot study at Frederiksberg Hospital was: *The depressed patient's behavioural pattern differs from his/her behavioural pattern at recovery (discharge); a reduced social activity especially characterizes the depressed state.*

This hypothesis has been confirmed by a main study. We found 16 behavioural markers of depression and 22 markers of improvement (recovery). The markers show significant changes in frequencies from depression to improvement, many highly significant (t-test). Moreover, the behaviour has been described by 7 parameters also showing significant changes from admission to discharge. Finally the main study showed (not foreseen in the hypothesis from the pilot project) that nonverbal communication behaviour seems to be extremely inhibited during depression, relatively more than verbal communication.

In this context I won't enumerate all the markers technically. However, I consider it useful to mention some of the most characteristic behavioural elements to illustrate endogenous depression and recovery according to a systematic and quantitative ethological analysis.

A-1) Behavioural markers of endogenous depression (i.e. elements showing high frequencies at depression and significantly lower frequencies at recovery).

- Lie in bed
- Rest/Sleep
- Social withdrawal
- Sit - do nothing
- * Nonspecific gaze
- * Look down
- * Little self-activity

- * Little talk 1-5 sec
- * Very little talk > 5 sec
- * Very little nonverbal communication
 - * Nod
 - * Smile
 - * Laughter
 - * Gesture/Point
 - * Help

A-2) Parameter with significant fall from first to last week of hospital stay

-Introvert eye fixation (= Non-specific gaze + look down + closed eyes)

B-1) Behavioural markers of improvement (recovery) (i.e. elements with significant rises from depression to improvement)

- Socially interested
- Distance to nearest neighbor=0-1m
- Arms apart
- Look at object
- Talk 1-5 sec
- Talk > 5 sec
- Nod/Thrust
- Frown
- Smile
- Laugh
- Gesture/Point
- Drum fingers
- Help
- Approach

B-2) Parameters with significant rises from depression to recovery

- Extrovert eye fixation (look at person + look at object + look around)
- Posture Flexibility
- Category diversity
- Element diversity
- Activity
- Verbal social initiative

The above mentioned behavioural facts generally characterize endogenous depression as social withdrawal and a thorough inhibition of motoric movements (low posture flexibility), of self-activity, of social interaction (low diversity and low activity), both verbally and non-verbally; the nonverbal communication

seems to be inhibited to a very high degree. Intellectual capacities were not studied directly in this investigation, but *ad libitum* observations demonstrated that ability to think clearly and quickly was reduced.

Improvement of recovery showed significant rises of posture flexibility and activity, both self-activity and social interaction. As the patients were observed for 3h 20min each week during all their hospital stay, we are also able to point to developmental tendencies from admission to discharge. Thus it appears that this development followed a rough sequential pattern: 1) dissolution of motoric inhibition, 2) dissolution of the inhibition of self-activity, 3) dissolution of social inhibition. We noted, however, that a relapse from improvement to depression had the reverse sequence: 1) disappearance of social interaction, 2) disappearance of self-activity, 3) development of withdrawal, nonspecific gaze and motoric inhibition.

The above mentioned significant markers and parameters are behavioural facts or appearances of endogenous depression and the following recovery as observed directly on a psychiatric ward. The question of whether endogenously depressed patients are submissive in a behavioural way can be answered only if we evolve a behavioural definition of submission and then submit actual behaviours to this criterion.

2. *Behavioural markers of submission*

In the same way as the syndrome of depression is rather vaguely defined, the concept of submission is also mainly understood on an intuitive and holistic level. To start with an intuitive feeling of what submissiveness is and then to postulate which well-defined behaviours from systematic, quantitative and statistical observations precisely correspond to this intuitive concept is very difficult. Nevertheless, I think that my

(beat own mouth, bend deeply down) and at the same time accompanying the signals with smile and laughter (laugh at oneself). 3. Sickness-metaphor. The person shows verbal and nonverbal efforts to obtain help and comfort.

Viewed in this way it is clear that these submissive behaviours are carried out voluntarily, consciously, flexibly, and with a greater or lesser degree of manipulative function. However, in the case of 2A-elements, the flexible use may be somewhat reduced (ie, postures may be maintained for rather a long time indicating that the subjective feeling of submission or defeat lying behind is not easily stopped). Thus it seems that the use of elements from 1, 2B, and 3 has a relatively high social adaptation and survival value, whereas maintaining 2A-elements for long periods probably indicates a reduced social adaptation. Individuals with such a liability may be more socially vulnerable than others - in risk of slipping down in hierarchy, or into the social border, or temporarily into a direct withdrawal situation with the possibility of feeling inferior or depressed. In this way - and in certain individuals - submissive behaviours that are originally used in a voluntary way may be maintained for long periods (compare fixations of tics and postures in neurotic behaviour)¹⁹ with the consequence of involuntary psychic reactions.

3. *Are endogenously depressed patients submissive?*

Demonstration of behavioural facts characterizing endogenous depression with an attempt to define submission in behavioural terms makes it possible to answer this question.

Endogenous depression characterized in a purely behavioural way is:

1. - withdrawal
 - nonspecific gaze
 - social/intellectual inhibition

- self-activity inhibition
- motoric inhibition

Submission is behaviourally defined in Fig 1.

2. According to this definition, endogenously depressed patients show a clear reduction of the active, flexible, and manipulative use of submissive behaviours. The flexible use (ie, behaviours are easily started and stopped) of the submissive "tools" of communication is much inhibited. If a patient is addressed socially, he/she shows avoidance or cut-off behaviours more than submissive elements; moreover many displacement activities like preen, fumble, rub, and rock are shown - probably indicating uneasiness about the social interaction (see Fig 1, social border). The patient clearly prefers to be alone (withdrawn). The submissive metaphors of ingratiate (1) and flexible-pacify (2B) are totally absent. The metaphors of sickness (3) may be shown now and then. The more static or long-lasting pacifying tools (2A) like cessation of talking, immobility of the body, look down etc may be compared to the statistically found behavioural characteristics like social inhibition and motoric inhibition. Viewed from such an angle, this behavioural inhibition may be interpreted as long-lasting or fixated¹⁹ pacifying behaviours from category 2A. This interpretation may support an evolvement of a long-lasting social and motoric inhibition from pacifying behaviours of category 2A (more or less static postures).

So the final comment to the problem must be: a) endogenously depressed patients show a reduction/great reduction of the flexible, active, and manipulative use of submissive behaviours; b) in a social context they show avoidance or social cut off; c) their great social and motoric inhibition may be interpreted as involuntarily evolved static submissive behaviours (fixations), a sort of ex-

treme submissiveness or yielding.

4. Are *patients who recover from endogenous depression more submissive than normals*?

This question is contiguous with the previous question. In order to answer the question it is necessary to carry out an investigation of normals observed in exactly the same way as the 11 endogenously depressed patients. At the moment we are conducting such a study of a group of normals admitted to a medical ward because of a physical disease. When the study has come to an end it will be possible to assess if recovered patients in general are less social than normals, or if they show significantly lower values of some social elements than normals. If they prove to be less social this may be interpreted in the way that they are more submissive. Probably there are fairly great social differences among recovered patients. Three of 11 recovered patients showed very low values of social interaction compared to others.

5. *Did the depressive syndrome evolve as an involuntary yielding component of ritual agonistic behaviour?*

As already mentioned in section 3 the social and motoric inhibition of endogenously depressed patients may be interpreted as an involuntarily evolved fixation of submissive behaviours (no communication, fixed inferior postures). Whether this is reasonable or not, I think that the involuntary yielding hypothesis seems interesting. I should like to contribute to the hypothesis by illustrative examples and by suggesting a few behavioural mechanisms which in my opinion might advance involuntary submissive processes and behaviours and finally lead to depression (ie, primarily reactive or psychogenic depression).

Example 1. Von Hoist showed that a weak male tree shrew (Tupaia) together with a strong, dominant male

Tupaia in a cage would sit immobile in one corner. Attempts to "revive" the inhibited animal by handling and "caressing" were futile. This immobility of the animal seems analogous to the motoric inhibition in endogenous depression.

Example 2.²¹ A small school girl of 6 years old was mobbed by other girls. She showed the following behaviours sequentially: 1. Defense (shout, push). 2. Alternating crying and shouting. 3. Crying. 4. Looking for comfort with teacher and mates.

Example 3. A girl of 13 years old was mobbed by school mates. She showed 1. Defense. 2. Withdrawal with restless walking, look down, sulky mouth, kick things.

These examples show a general pattern of the evolution of defeat in ritual agonistic situations: 1. Defense (aggression); 2. Ambivalence, alternation of aggression and submission; 3. Submission 4. Two ways out: a) escape, withdrawal, b) seek social help, comfort; 5. No way out (no possibility of attack or escape).

Children who seek comfort recover quickly and regain their social status. Children who escape or withdraw have greater difficulties in getting social contact again.

An interesting point in the evolution of defeat or a felling of defeat (feeling generally depressed) is the ambivalent phase with aggression and submission alternating.

Situations in which an individual is stressed with no possibilities of attack and escape seem crucial. Such situations may often exist in the social dominance hierarchy because real attack and real escape are not possible according to conventional social rules. Ritualized aggression or assertion may be "legalized" as humorous, ironical, or sarcastic remarks. However, such ritual agonistic metaphors may not be "mastered" to the same degree by all individuals - hence dominance hierarchies or

"pecking orders" develop.

In such ritual agonistic interactions possible stress factors (that may be of different strength depending on different individuals' vulnerability) may increase according to three behavioural mechanisms;

1. High intensity of the stressor (mother deprivation, social deprivation, attack)
2. Long duration of the stressors
3. Iterative (frequently repeated) stimulation by the stressors (e.g. mobbing)

Duration and iterative stimulation may be very effective for provoking or releasing high arousal states which are so intense that they cannot be controlled any longer by the will, ie, an involuntary psychic reaction is evolved and "runs" its own way, which in this case leads to the depressive syndrome. At the same time as the involuntary feeling/depression exists, it is constantly stimulated by the consciousness which is also excited to an aroused level which is difficult to decrease. Thus consciousness and affects probably compose a vicious circle.

In practice the significance of the mechanisms mentioned above is easily illustrated. For instance repeated irritation of a person will cause a release of fury, a state which may be maintained for several minutes after the release with small chances for the furious person to stop his aggressive feelings voluntarily. Likewise with anxiety, fear, love, and hatred.

The social stressors from ritual agonistic interactions may thus be possible releasers of psychic processes and nonverbal behaviours that are perceived as depression. These stressors (environmental stimuli) act basically on genetic propensities.

During ontogeny (especially sensitive periods) individuals very sensitive to social dominance may develop fixations of submissive reactions

(depression) or nervous reactions (tics) which means that very stressing experiences during sensitive periods ("imprinting") may reinforce genetic pre-programmes. Such an ontogenetic imprinting gives a higher risk of release of submission and depressive states. In the case of endogenous depression we know that the genetic factor plays a considerable role, but no doubt environmental matters are also important; such important characteristics from the environment might be "imprinted" during sensitive periods of childhood and youth (puberty).

I should like to mention the following in answer to the question: Can the depressive syndrome be evolved as an involuntary yielding component of ritual agonistic behaviour? Many examples from animals, children and grown up people seem to point to the involuntary yielding hypothesis as plausible. I think it is reasonable to assume that persons vulnerable to endogenous depression may also be influenced by ritual agonistic behaviours with the risk of a release of depression. However, what may be particularly specific about endogenously vulnerable persons may be that their sensitivity or releasing threshold according to social stressors may change over time merely because of unknown/(?)endogenous factors. Also compare the characteristic diurnal changes of these patients. At some times their vulnerability to social stressors may be greater than at other times.

6. *How to explain the paradox of submission/depression with assertion/aggression?*

In fact this paradox can be derived from the ambivalence in a conflict situation (ritual agonistic behaviour). As illustrated by examples from children section 5 (sadness, reactive depression) the ritual agonistic interaction seems to have a characteristic ambivalent

phase containing both attack (aggression) and escape (fear, submission) tendencies. This conflict of two basic motivational states may continue after defeat and withdrawal, stimulated by thought. Primarily it may appear behaviourally with an emphasis on escape (fear, anxiety) but now and then aggressive tendencies (redirected aggression) may show up.

In the 16 endogenously depressed patients studied in Frederiksberg Hospital the normal development from depression to recovery is a gradual change of behaviour (gradual rise of diversity and activity) with self-activity as a characteristic transitional phase. However, in a patient diagnosed as agitatedly depressed there was a clear alternation during the first week of submissive/withdrawal tendencies and assertion/aggression tendencies. In two or three patients there were direct aggressive elements (verbal and nonverbal) during the transition phase. Also in two patients the development was characterized by improvement tendencies with affiliative and assertive (aggressive) tendencies and relapses with submission (withdrawal) tendencies.

This means that the paradox seen in the reactive depression can also be observed in the endogenous depression. It may indicate similarities between the two diagnoses.

Regarding the assessment of the psychic state at discharge the constellation of behaviours are of great importance. A clear overweight of affiliative and assertive elements seems optimal for discharge, whereas a mixture (a paradox) of affiliative/assertive behaviours and submissive/escape behaviours (depression markers) are considered a risky basis for discharging the patient.

Also characteristic facial expressions of the endogenously depressed patient may illustrate the above mentioned paradox. The mouth is neutral

or with mouth- corners downwards (indicating inhibition of affiliative motivation). The eyes show non-specific gaze (probably expressing inhibition indicating "No way out", "Hopelessness", "Problems cannot be solved". Nonspecific gaze may be interpreted as a motivational conflict between social attraction and fear or aggression and fear). The eye region shows an increased degree of opening (indicating anxiety). In other words: The constellation of facial expression probably also indicates motivational conflict (paradox).

7. An evaluation of the evolvement hypothesis

Based on several examples from animals, children, and grown ups (mobbing, different kinds of social deprivation, bereavement) the evolvement of a reactive depression in connection with involuntary yielding seems plausible. However, because of the developmental behavioural process, the depression may contain not only submissive, yielding or escape tendencies but also assertive, aggressive or attack tendencies.

Because endogenous depression or melancholy obviously has the behavioural and motivational paradox or conflict in common with the reactive depression it may well be released by ritual agonistic interactions and evolve according to the hypothesis. A sequential evolvement might then be: 1) Agitation, 2) Depression, inhibition, 3) Melancholy, great inhibition, stupor.

Some endogenously depressed patients point to social incidents as possible releasers; however, most patients are not able to find an external reason. Thus it is reasonable to perceive melancholy as primarily genetically determined; diurnal and seasonal rhythms with different durations and intensities of light²³ are well-known proposed hypotheses related to melancholy. The sensitivity to external stressors (especially.

social conflicts) may change according to such endogenous or seasonal rhythms. Thus a French study shows maxima of suicides in spring and autumn.²⁴

8. *Implications for a behaviorally based therapy.*

No doubt there is an interaction between behaviour as environmental stimuli and neuro-physiology. Thus more or less clearly defined social stimuli may function as kinds of key-stimuli or releasers of basic Dehaviour tendencies like contact, attack, and escape with the probable corresponding motivational states or subjective feelings of happiness, aggression, and fear. McGuire & Troisi point to a selected behaviour-physiology interactions in non-human species as well as in humans . These data in fact may be interpreted as supporting the evolvement hypothesis of depression in the way that the described behaviours or situations indicate conflict or inhibition.

Moreover, social stressing situations like social ambiguity, decreased social contacts, inhibited behaviour, and loss of loved ones show changes in, for instance, serotonin, norepinephrine, epinephrine, ACTH, and the immune system, each of which may be biochemical expressions of the corresponding behavioural and depressive appearances. McGuire and Troisi also elaborate the regulation-deregulation theory²⁵ with relevance for the implications of the behaviour-physiology interaction. Schelde comments similarly

The theory postulates that certain types of social interactions and certain frequencies of such behaviours function as regulator mechanisms of physiological states, eg, mental states or moods. The so-called essential behaviours are considered to be: receive and give praise, recognition, encouragement, comfort, smile, touch etc. Further the theory implies that certain social interactions (eg,

ritual agonistic behaviour) are proximate mechanisms or releasers of the onset of psychiatric disorders.

McGuire & Troisi's very illustrative figure²⁵ of high- and low-risk animals shows equal cortisol levels of the animals in nonstressful housing. But in stressful housing the high-risk animals show high levels of plasma cortisol accompanied by anxious and fearful behaviour, whereas the low-risk animals only show moderately increased levels of cortisol and this is accompanied by play and exploratory behaviour. It is important to emphasize threshold effects. If the social stressing situation lasts longer than a certain level, there may greater risk that the cortisol level increases to greater heights in high-risk animals and that behaviours and motivational states also develop involuntarily, ie, static submissive behaviours, inhibition (feelings of depression in humans) become fixed.

Therefore - related to humans - the following behavioural strategies might be of value:

1. Look for social help - essential behaviours

Very soon after a social defeat or a feeling of defeat a depression-vulnerable person (high-risk person) should look for and elicit essential behaviours from others, ie, behaviours that most likely have a regulating function (neurophysiologically). The time lapse from defeat to help should be as short as possible; otherwise consciousness and affect may constitute a vicious circle raising the arousal level and biochemical correlates to such a degree that the depressive moods get more and more fixed.

2. Look for diversion

Most likely elicitation of essential behaviours is the best regulator of deregulated moods. But also general diversion may have some regulating function (e.g. cinema,

theatre, sports, etc.). Already in 1886 the Danish psychiatrist Carl Lange²⁶ proposed different kinds of environmental stimuli (multidiverse stimulation) as means to prevent some of the inconveniences of depression. He also stressed social activities as important.

3. Learn to cope with ritual agonistic behaviour

What may be a problem with many depression vulnerable persons is that they may have special drawbacks in nonverbal communication. A person who has shortages in the nonverbal communication markers nod, smile, laughter, gestures, help^{10c} probably also has difficulties in eliciting essential social interaction or the necessary frequencies of such behaviour. Such persons might be informed of the importance of nonverbal communication tools - also some training might occur. Especially - as proposed by Price¹⁶, they should be encouraged to settle conflicts by peaceful means, ie, by affiliative, assertive (not aggressive), and manipulating submissive behaviours (not static ones).

4. Learn to avoid risks

To cope seems better than to avoid. However, in the case of high-risk situations, the person vulnerable to depression should avoid an interaction. An important point here is to make it clear what types of stimuli may be high-risk releasers.

The four above mentioned points propose a model of a general behavioural strategy based on regulation-deregulation theory and the yielding hypothesis. Points 3 & 4 have a prophylactic function, points 1 & 2 a therapeutic one. In an interaction between doctor and patient these four principles may be exemplified and the psychiatrist may prescribe individual behaviour tactics in accordance with the proposed basic strategies. Much more research on these suggested behaviour-

physiology mechanisms is required. But an increase of such a knowledge will no doubt contribute to a better understanding of the effects of environmental stimuli on neurophysiology. And it will secondarily contribute to prescriptions of better behavioural strategies.

Summary and conclusion.

Endogenous depression is behaviourally characterized by an inhibition of social interaction, self-activity, and motoric movements. The extensive inhibition may be interpreted as fixated, long-lasting static submissive behaviours; but active, flexible and manipulative submissive behaviours are not present. Moreover it is considered that endogenous depression can be released by social ritual agonistic behaviours, especially because it shows similarities with reactive depressions as regards "paradox" behaviour. But it is emphasized that it may very often be released by unknown endogenous factors. Finally a general model of behavioural strategy is proposed. The knowledge of the principles of the model may be of practical help to depression-vulnerable persons and to professional people. With a growth in the research of the interaction regularities between environment/behaviour and biochemistry/physiology we will increasingly be able to prescribe effective behaviour strategies and tactics for different kinds of depression-vulnerable persons to avoid depression releasing factors. However, such a research is comprising and will need many researchers, money and time.

But I think this kind of research is crucial just because affective illnesses may evolve as an interaction between environmental stimuli and endogenous factors. It is difficult to see how we can manipulate genes in a manic-depressive person, but surely we can learn to a much greater precision to master environ-

mental influences.

1. Quoted by Schad-Somers, Susanne P (1990) On Hood Swings: The Psychobiology of Elation and Depression NY:Plenum Books, p130
2. For ASCAP Newsletter Volume 3 (Jan through Dec, 1990) please send \$18 (or equivalent) for the 12 issues. Make checks or money orders out to "Department of Psychiatry and Behavioral Sciences, UTMB." Note on page 11 that subscriptions for ASCAP Newsletter Volume 4 (Jan through Dec, 1991) are now being taken.
3. ASCAP philosophy and goal. High scientific importance rests on comparing animal behaviors across-species to understand better human behavior, knowing as we do so that evolutionary factors must be considered for understanding properly such behaviors. To accomplish these comparisons, very different new ways of viewing psychological and behavioral phenomena are required. This in turn explains why we need new words to define and illustrate new dimensions of comparisons across species. We expect that work in natural history biology combined with cellular-molecular biologic research will emerge as a comprehensive biologic basic science of psychiatry. Both top-down and bottom-up analyses are needed. Indeed, this must happen if we are to explain psychiatric illnesses as deviations from normal processes, something not possible now. Compare to pathogenesis in diseases of internal medicine.
4. The author wants to address a warm thank to Overlæge, Dr.med. Einar Geert-Jorgensens og hustru Ellen Geert-Jorgensens Forskningslegat, that supports ethnological-psychiatric research in Frederiksberg Hospital, Department of Psychiatry.
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